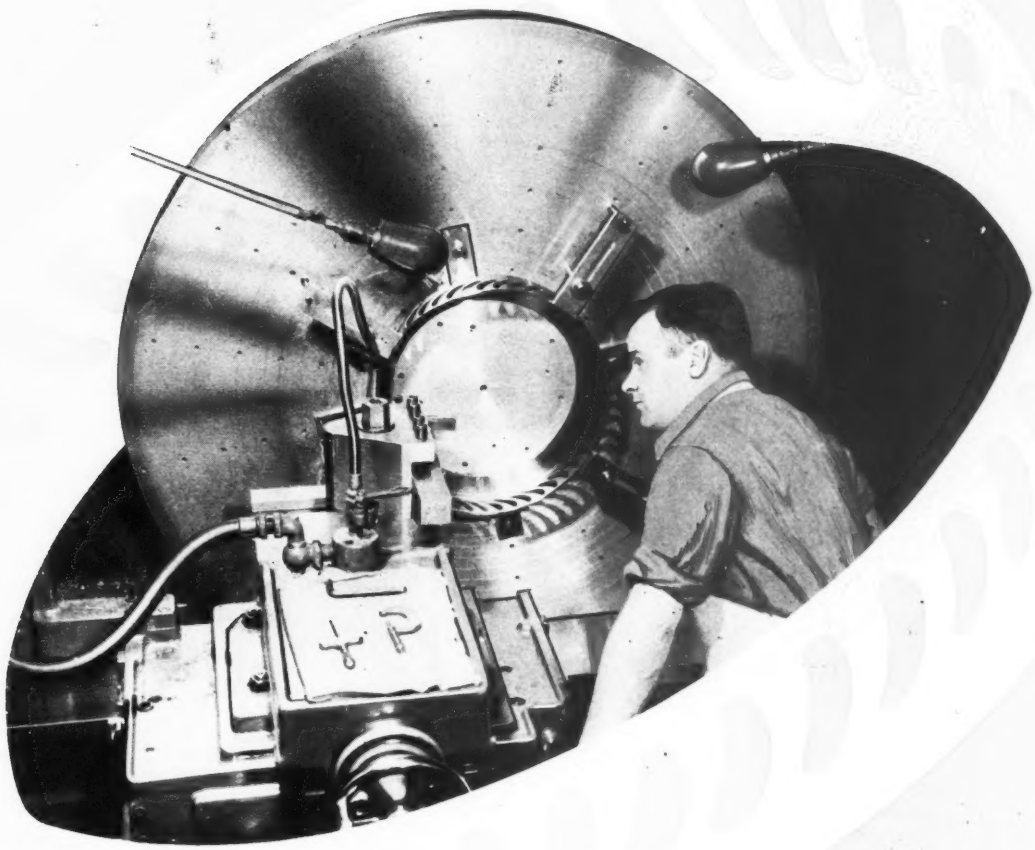
FEBRUARY 11, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

OHIO STATE



FOR JET JOBS—
Special Lathes

—see page 86

MORE DECONTROLS IN THE WIND
—Cause: Rising Steel Inventories, p. 53

SPECIAL PURPOSE MACHINERY
—Civilian-Military Balance Delicate, p. 57

VOLUME HEAT TREATING
—Fast Turns for Steering Gear, p. 82

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Let's take a CLOSER LOOK at STRAIGHT-CHROMIUM Stainless Steel Tubing

Present restrictions on nickel have cut production of austenitic stainless steel tubing far below demand. If this critical shortage of nickel-bearing stainless tubing is compelling you to find other suitable grades, you should take a closer look at the straight-chromium analyses.

Readily available in quantity from B&W are pipe and tubes of the four non-nickel-bearing types listed at the right with typical uses. These ferritic and martensitic steels are magnetic at ordinary temperatures after all conditions of heat treatment, have relatively high oxidation resistance at elevated temperatures, and resist attack by many corrosive media. With certain modifications in procedures, they can be satisfactorily fabricated by all methods applicable to austenitic grades.

For both pressure and mechanical applications, tubes of straight-chromium stainless analyses are worthy alternates for hard-to-get nickel-bearing stainless types. Would you like a copy of TDC-140 containing technical data on these easy-to-get grades of stainless tubes? Ask Mr. Tubes—your B&W Tube Representative—about their suitability for your applications.

APPLICATIONS

B&W Croloy 12 A1 (Type 405, Seamless)—Non-hardening—does not undergo appreciable transformation; therefore no sudden volume change occurs during heating—corrosion and oxidation resistant. Typical uses: Conveyor lines in oil refining and chemical processing, heat exchanger tubing, boiler tubing in mercury heat cycle, catalytic oil cracking processes where fins have been welded to tubes.

B&W Croloy 12 (Type 410, Seamless and Welded)—Hardenable—moderate corrosion and heat resistance. Typical uses: Machinery in the chemical and food processing and packaging fields.

B&W Croloy 18 (Type 430, Seamless and Welded)—Sufficient ductility for forming simple parts—good corrosion and oxidation resistance—can be polished or buffed to pleasing finish. Typical uses: Conveyor lines in chemical processing field; condensers and piping in production, transportation, and storage of nitric acid and in nitrating operations involving mixed acids; furnace parts; retorts; ornamental structures.

B&W Croloy 27 (Type 446, Seamless)—Corrosion resistant—excellent heat resisting qualities. Typical uses: Furnace parts, heat interchangers, kilns, pyrometer protection tubes, soot blower elements, dehydrogenation equipment in chemical and oil refining fields. Also well suited for glass sealing applications.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

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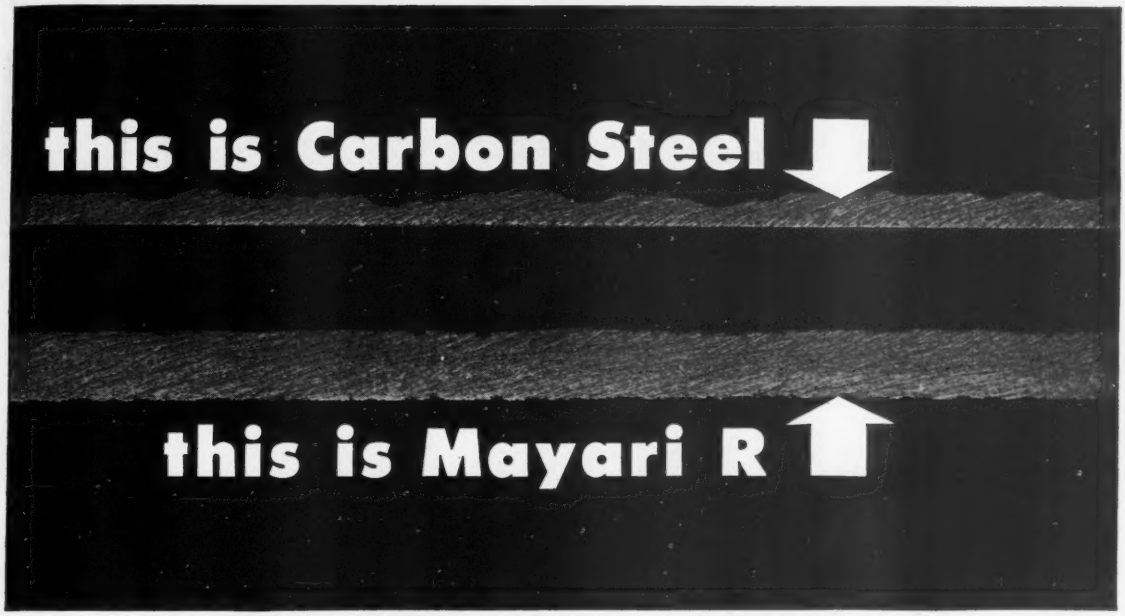
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas • Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-16515

AFTER 5 YEARS' EXPOSURE...



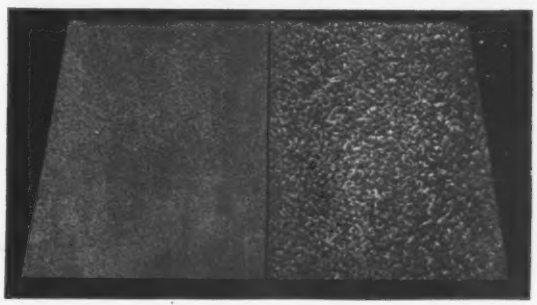
This unretouched photograph shows cross-sections of a carbon steel sheet and a Mayari R sheet after exposure. The photograph is approximately 4 times actual size.

You can see what corrosion has done to these steel sheets. One is plain carbon steel, the other is Mayari R, and both were originally ⅛ in. thick. They were exposed together in industrial atmosphere for 5 years. During this period the carbon steel sheet lost so much through corrosion that it had to be replaced, but there was no appreciable loss of thickness in the Mayari R sheet.

There is a simple reason why Mayari R has such excellent resistance to atmospheric corrosion. When this steel is exposed, a thin, tight layer of rust forms on the surface to act as a protective coating. This rust does not flake off in the manner of carbon-steel rust. Instead, it holds securely to the surface and retards any further corrosive action. As a result, Mayari R has from 5 to 6 times as much resistance to atmospheric corrosion as plain carbon steel, and from 2 to 4 times as much as copper-bearing steel.

Mayari R also has other advantages. It has better abrasion-resistance, higher yield point, and greater tensile strength than ordinary carbon steel. It can be used to save steel, to reduce surplus deadweight, and to increase the service life of equipment and structures.

Our Catalog No. 259 contains more information about Mayari R, its properties and applications. Write or call the nearest Bethlehem sales office for a copy.



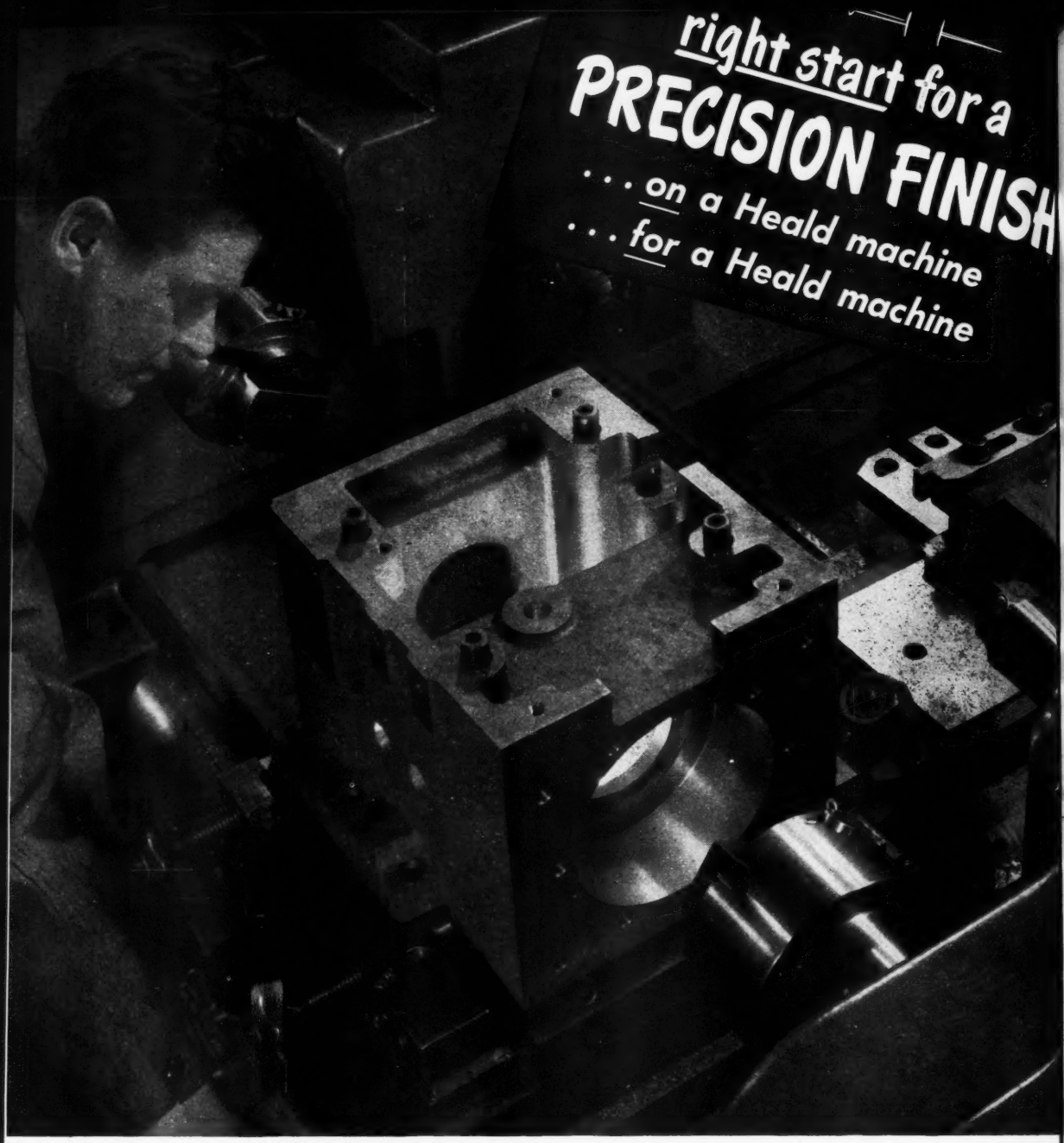
The same test specimens as seen from above. After 5 years' exposure the Mayari R is relatively smooth while the carbon steel is deeply pitted.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

Mayari R *makes it lighter...stronger...longer lasting*



HERE'S precision in the making. One Heald machine helping to produce another. The Model 422 Bore-Matic shown above is precision finishing a workhead housing for a Heald Internal Grinding Machine. This double end setup bores two diameters, forms two radii and faces one surface on each end of the work. Diameters, concentricity and face squareness are all held to 0.0002 inches. Yes, it *takes* Heald precision to *make* Heald precision. That's one reason why your Heald machines can always be depended on for faster, easier and better production of precision finished parts.

HEALD

Heald machines speed the nation's production

THE HEALD MACHINE COMPANY

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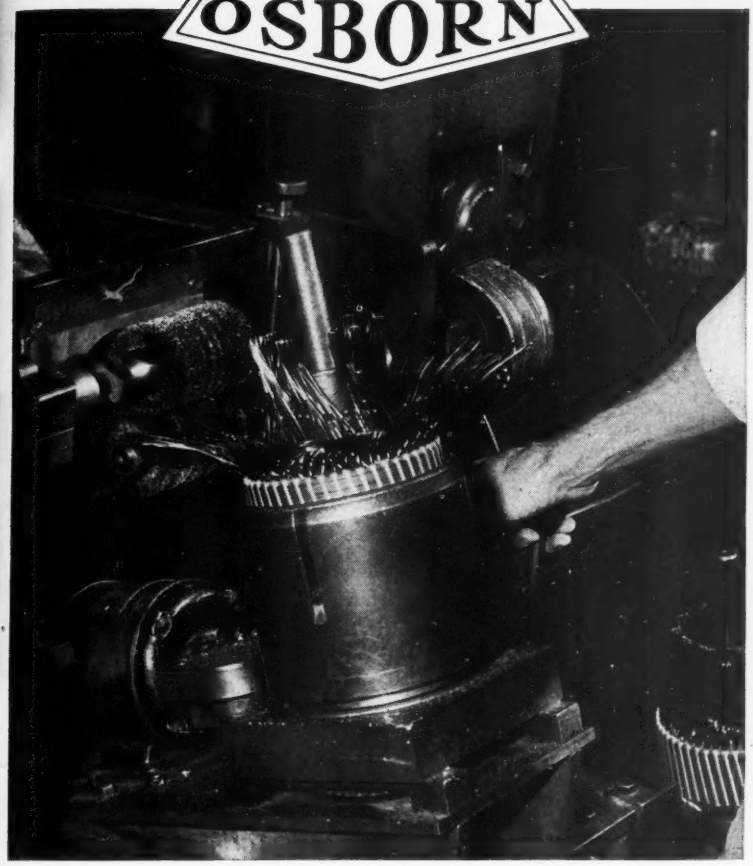
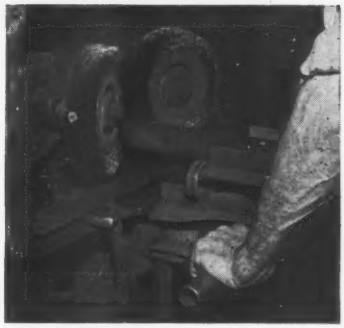
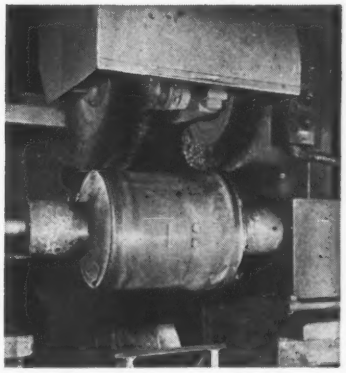
Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

OSBORN





OFF COMES RUST. These two counter-rotating Osborn Master® Wire Wheel Brushes, powered by 1½ h.p. motors, clean rust and scale from 2-inch pipe preparatory to fabrication. Cleans 15-feet of pipe per minute . . . at the push of a button.



OFF COMES SLAG. It takes only 40 seconds for these Osborn Wire Wheel Brushes to whisk away all slag and scale from both end welds of compressor heads . . . at the push of a button.

How to make parts come clean . . . at the push of a button

It takes only 8 seconds to remove the enamel insulation from the entire bunch of a motor's coil leads with the set-up shown above. This stripping, preparatory to soldering, is done with Osborn power brushing . . . automatically . . . at the push of a button.

Wire stripping is typical of thousands of cleaning operations throughout Industry which have been simplified and speeded by Osborn Power Brushes. Your **O**sborn **B**rushing **A**nalyst is experienced in finding solutions to cleaning and finishing problems of all kinds.

His service is backed by the extensive engineering facilities of Osborn, to devise brushing methods and special machines *to help you.* There is no obligation. Call today or write *The Osborn Manufacturing Company, Dept. 612, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OFF COMES FLASH. Removal of rubber flash of rubber-to-steel joints of army tank track shoes is simply a matter of sliding the shoes across the face of an Osborn Disc-Center* Wire Wheel Brush. A mass production operation . . . at the push of a button.

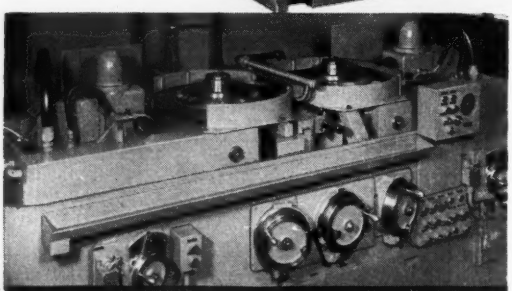
*Trademark

Osborn Brushes

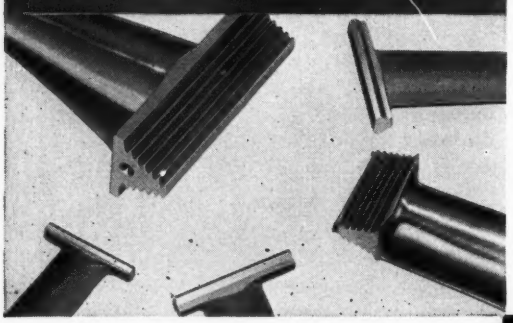
OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

Production-Proved EX-CELL-O Machine Grinds Jet Blade Roots

Ex-Cell-O Style 53 Precision Two-Wheel Form Grinder for grinding roots of jet engine blades.



The machine uses two wheels to grind both sides of the root form simultaneously.



Dovetail and pinetree forms, in various sizes, are ground from rough forgings.

PRECISION TWO-WHEEL FORM GRINDER GIVES FINE FINISH, HIGH PRODUCTION

This production-proved Ex-Cell-O Precision Two-Wheel Form Grinder finishes roots of jet engine blades with speed, economy and precision. It is fully automatic except for loading, unloading and pushbutton starting.

Two 24-inch diamond-dressed grinding wheels are used, the work reciprocating between them. Dovetail or pinetree forms of various sizes can be ground economically from semi-finished and rough forgings. Work reciprocation, wheel feed to finish size, coolant control, unclamping, wheel retraction, and wheel dressing are all done in an automatic cycle.

Controls are so simple that unskilled operators can do this high precision work. For more information and complete specifications contact Ex-Cell-O in Detroit.

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EX-CELL-O *for* PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS
RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT
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51-34

STEEL

The Weekly Magazine of Metalworking

VOL. 130 NO. 6 **FEBRUARY 11, 1952**

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Next Week **... More Zip for Strip Handling ... Holding Fixtures Simplify Fatigue Testing ... Tooling Can Be Cheaper ... Electronic Hammer Forces Metal to Change**

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Smoother Finish Longer Tool Life

with

PELRON Cutting Oils

Here's what production men have been praying for—cutting oils that will give smoother and freer removal of metal, with cooler operation and longer tool life.

PELRON CUTTING OILS, developed through extensive research following the newer theories of water soluble cutting oils, have the unique property of breaking loose successive globules of oil at the point of extreme pressure for extra lubrication. Once past the pressure point, or inter-face of the tool, PELRON cutting oils immediately go back into a stable emulsion. This characteristic accounts for the unusually smooth cutting action, the prolonged tool life and all-round improved machine operation.

PELRON CUTTING OILS are clear, light amber and remain so, giving good visibility at the work point. They form a complete and permanent emulsion with water of any type and hardness.

They settle chips readily in the system, prevent rancidity, odor, or deterioration. In fact, they can be used for months on cast or malleable iron with no rusting, odor, or breaking down of the emulsion.

ISN'T THAT WHAT YOU'VE BEEN PRAYING FOR?

Contact our nearest sales office for a sample and demonstration. Our metal processing experience and engineers are at your service. Let's hear from you.

PELRON CORPORATION

7740 W. 47TH STREET
LYONS, ILLINOIS

Sales offices: Chicago • Detroit • South Bend
Cleveland • Milwaukee • Indianapolis • Rock Island

Behind the Scenes...

Feminine Touch

We note with mixed emotions that women, having successfully invaded just about every profession historically dominated by the stronger sex, are now organizing to strengthen their foothold and broaden their influence.

From Chicago comes word that the newly-formed Women's Society of Engineers will be among the engineering groups celebrating the Centennial of Engineering next summer. The organization adding this feminine touch was formed late last year and already boasts more than 200 members from all sections of the country and represents various branches of the engineering profession.

Easy Scanning

Six years have passed since the editors originated the weekly feature Production and Engineering News at a Glance. It's found this week on page 81. In this space each week Engineering Editor Walter Toerge and his staff bring you spot news of technical developments in metalworking and metalproducing industries and highlights of the production-engineering section. Much material used in the feature describes laboratory developments that could soon be established production procedures.

Trivia

A letter received in the business department from a Pakistan trading company ends this way: "Hoping that needful will be done early which will be greatly appreciated and thanking you once again, We are, Dear Sir, Very truly yours . . . "

Advertising slogan of General Motors' New Departure bearing division should be revised, says E. J. Ehret of Ehret & Kinsey, manufacturers' representatives, Chicago. He suggests: "Nothing rolls like a ball—except a cuff link."

A news item forwarded to us with comment on influence of Western comic books, movies and television programs on modern life tells that the state of Nebraska has been stricken with a wave of tractor rustlings in the past six months.

We were reminded that February marks the occasion of the Annual Fig Festival and that Kraut and Frankfurter week began last Thursday. It overlaps Boy Scout Week, which began Feb. 6. We've been following the newspapers closely for a Boy Scout dinner with franks, kraut and figs on the menu.

What Is It?

Meandering through the files of gimmicks given away at past conventions and exhibitions, we turned up the following hoary puzzler:

Reproduced above is an unretouched photograph of a common object, vegetable, mineral, or animal. It's not necessarily printed right side up. Can you identify the object? It's no bull!

Puzzle Corner

Answer to the Jan. 28 puzzle; The two boys playing snatch apple would have to stand 4 feet apart. First in with correct answers were Ralph Arnold, Fort Pitt Bridge Works, Pittsburgh; Ernest Snedker; Elgin National Watch Co. Abrasives Division, Baltimore; H. Maier, Ideal Wrapping Machine Co., Middletown, N. Y.; Wm. McCord, Baltimore; and Olga Roberts, Service Iron & Steel Co., Akron.

A man going on a journey left $1000 with his son. He said that while he was away a bill would come in for some amount from $1 to $1000, in even dollars. His son was to pay this. The father left the money in ten sealed envelopes, divided so that whatever the amount, it could be paid without having to open any envelope. What was the amount in each envelope?

Shrdlu

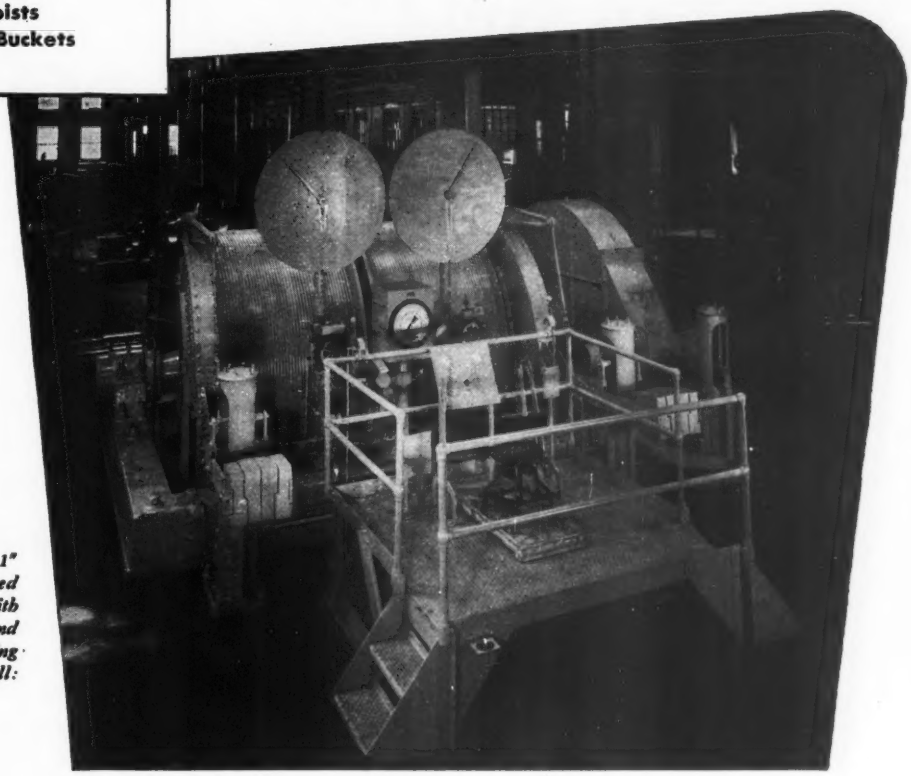
(Metalworking Outlook—Page 45)

Wellman will build it

Special Cranes
Mine Hoists
Car Dumpers
Gas Producer Plants
Ore Bridges
Charging Machines
Industrial Furnaces
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Skip Hoists
Clamshell Buckets

Wellman Electric Mine Hoists

Proved by performance



Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' x 13' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

● For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our 50 years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactorily.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

NOTE

This plan is designed as an exchange between steel users (not dealers or brokers). All sales are subject to the applicable CMP and OPS regulations.

Ryerson Will Help You ...SELL STEEL you can't use...

The Plan In A Nutshell

1. Check your plant for stagnant steel you can't use.
2. Spot all idle and unneeded metal-working machinery.
3. Decide what to sell, and what should be scrapped.
4. Send us a detailed description of the usable items.
5. We will publish your description without cost as a classified advertisement in the Ryerson Pictorial (read by over 100,000 steel users, coast-to-coast).
6. Your ad will be identified by number, and we will promptly forward all replies to you.
7. You make your own deal with the company—or companies—that reply. As we will not be familiar with the quality or condition of the items for sale, we can only serve as the connecting link.

REMEMBER: Your listings must be received by us no later than February 18th as the Ryerson Pictorial goes to press promptly.

se...BUY STEEL you need

Plan Also Applies to Metal-Working Machinery and Equipment

Steel is in such short supply today that we have been considering every possible way to make the available tonnage go further. And we have also been looking for ways to get out more scrap so that more steel can be produced.

Yet scattered throughout the country, in thousands of factories and mills, uncounted tons of usable steel, workable machinery and potential scrap are lying idle. This may be due to design changes, a switch from civilian to defense production or other reasons. In any case the problem is how to get the two together—those who want steel and those who have stagnant steel they do not want.

As a service to industry we are opening the pages of our Ryerson Steel Pictorial for just such a national steel exchange.

Here's what we do for you

Your company and any other manufacturer that has stagnant steel stocks or idle metal-working equipment may run a classified ad free of any charge, in our Pictorial newspaper. We are making this offer on a nationwide basis and expect to receive ads from thousands of companies. So in this way you may be able to find steel or equipment you have been searching for.

And since the Pictorial is regularly read by more than 100,000 steel users in every line of business and in every part of the country, there is a good chance that you will also find a buyer for any steel or equipment you send us for listing.

That's why we urge you to meet with your superintendent and storekeeper as soon as possible and—

1. Check your inventories for every lot of steel not marked for use. Check every department for idle metal-working equipment.
2. Decide what you will scrap and what you will try to sell.
3. Send us your classified ad in time to reach us by February 18 at the latest.

In furnishing information for your listings we suggest the following form: *Steel*—Give kind or analysis, shape, length, size, finish, condition (good, fair, poor) and pounds or tons involved. For carbon steel we suggest passing up any item of much less than one ton because of space limitations.

Metal-Working Machinery & Related Equipment

Give kind or type, manufacturer, capacity and condition.

When your ad appears, it will be identified by number only (so your firm name will not be disclosed) and classified by State and by type of steel or equipment. Replies will be forwarded to you promptly.

As you can see, this plan works for the good of everyone but your cooperation is important to its success. Let us have *your* listings of stagnant steel or equipment and we will work with you.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI • CLEVELAND
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NELWELD CASE HISTORY IN STEEL MILLS

At the rate of 4 to 5 per minute, Nelson studs are end-welded to the back plate of an open-hearth furnace door. Studs support refractory material and also cool it by carrying heat to the water jacket.

Taming Heat—to Boost Production

Facing heat in excess of 3,000 ° F., steel mill open-hearth furnace doors have a high mortality rate. Door maintenance and replacement costs run high. But far more important is the loss in steel tonnage and tie-up of material handling equipment and maintenance personnel, caused by every door change.

Working together, steel industry, refractory and Nelson engineers came up with an answer to this problem that is increasing door life as much as 1,000 per cent. One mill that formerly required 3,000 door changes per year is now down to less than 275 changes a year.

The answer consists of a pattern of Nelson granular flux-filled studs end-welded to the furnace side of the door, with the spaces between the studs ram-packed with insulating chrome ore. The studs provide proper support for the refractory and help cool it by carrying the intense heat evenly to the water jacket. This adds to the door's operating life . . . increases the time interval between changes . . . increases furnace availability . . . prevents losses in steel tonnage. In addition, material handling equipment and maintenance personnel are released for other operations.

Both the efficiency and life of boiler tubes is improved when Nelweld studs are quickly end-welded to the tubes, to support refractory linings.

Increased steel tonnage is obtained and fuel consumption is reduced with properly insulated water cooled tubes in slab and billet reheating furnaces. Nelweld studs used to support chrome ore are quickly and economically installed

If your manufacturing process involves the use of high heat and refractory materials which need mechanical support, perhaps the versatile Nelweld method can bring similar benefits to you. Discuss your problem now with a Nelson field engineer, or write Dept. S-4, Lorain, O.

Fasten it Better...at Less Cost, with NELWELD

T.M. REG.

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

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Free enterprise at work

An example of how a new machine tool opened up new fields for a Southern manufacturer

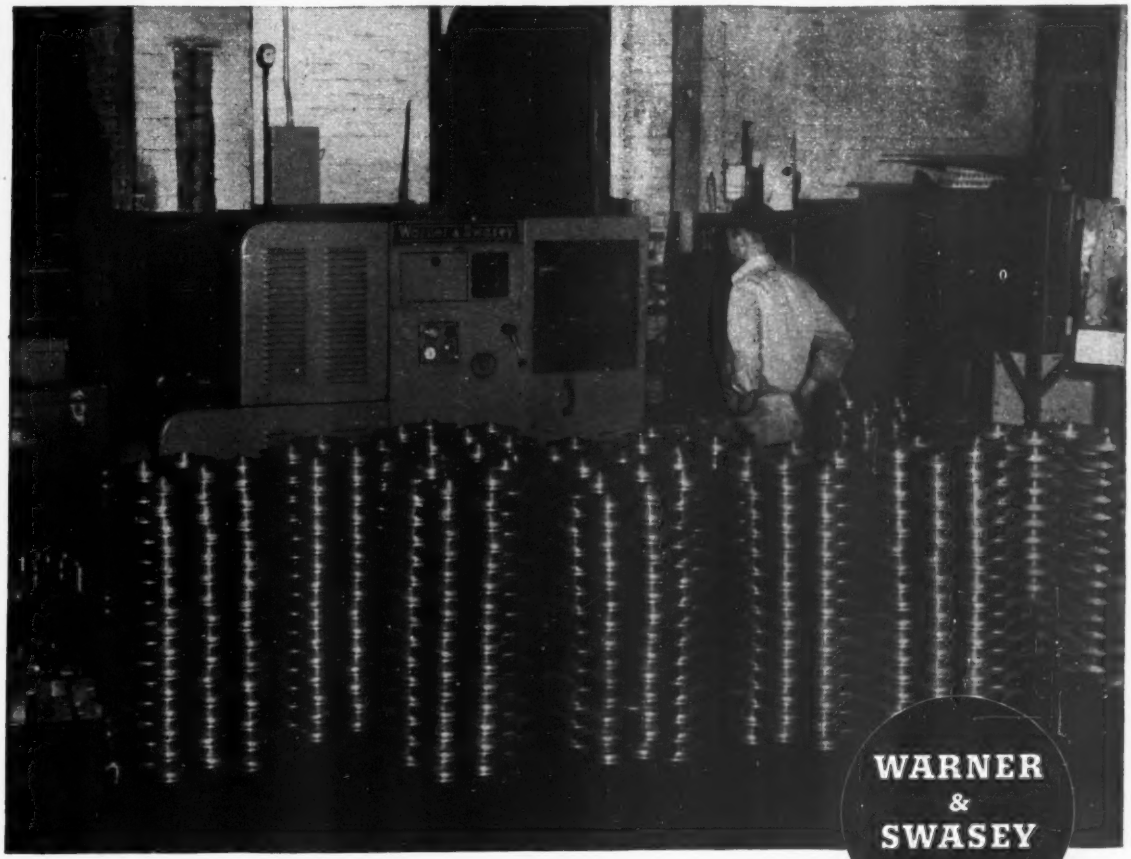
TO A SMALL BUSINESS in Columbus, Georgia, the term "Free Enterprise" is anything but an empty phrase.

The Goldens' Foundry & Machine Company had been machining a low profit item solely as a service to their customers. Their management had almost decided to discontinue this item when they heard of a new machine tool that would produce the job with a great deal more efficiency. So they dug into savings and bought the machine—a Warner & Swasey 1-AC Single Spindle Chucking Automatic.

The 1-AC greatly increased production at once—with accuracies of .0006" on important boring operations! This performance record of the new machine made it possible for Goldens' to bid on a big job for their shop—an 8000-piece run of high priority pulleys requiring short delivery. They produced the job quickly—then went on to handle more work than ever before.

Everybody has benefited. Customers are even more satisfied . . . operators like the ease of operation . . . investors are realizing new profits. And more work and more machines are in Goldens' future.

That's the story. But it's not an unusual one. They happen every day in work shops all over the country—continuing examples of how Free Enterprise really works!

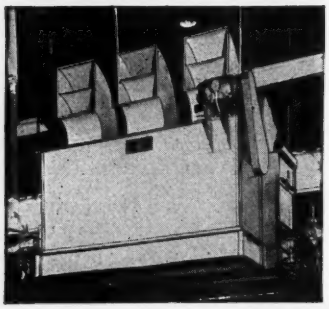


YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, AND TAPPING MACHINES

New HIGH PRESSURE STEAM Fan Heater

Gives Savings You Never Had Before

The first heater to make High Pressure Steam really trouble-free and practical in plant heating. Every engineer should understand its original method; write for Niagara Bulletin and performance data.



HOW IT OPERATES: — A dual coil system makes use of all heat, both sensible and latent. High pressure steam enters the upper coil, shown on the diagram below. Its condensate drains into a trap. Then this high pressure condensate is released into the header of the lower coil. It instantly flashes into steam at vapor pressure.

Any high pressure condensate that remains liquid is carried to the vapor condensate return header by a drain tube that also gives off its heat into the air stream.

The vapor condenses in the lower coil. Its condensate is kept at a high level in the return leg by a wier in the return header so that all its heat is made useful and it is sub-cooled by contact with the coldest air entering the heater. Vacuum condensate return to boiler is vapor free.

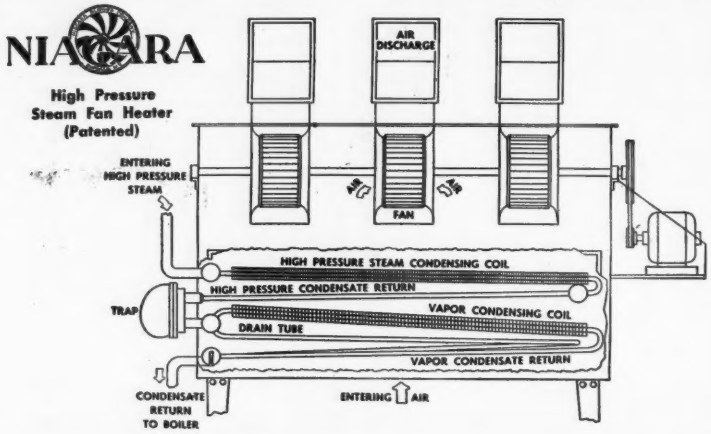
HOW IT SAVES IN COST: — Piping is much simpler and less costly than in low pressure systems. Much secondary piping, traps and big valves are not needed. Pipe sizes are smaller.

HOW IT SAVES IN OPERATION: — Waste is prevented. Every BTU goes where you want it. No dump traps or hot wells waste live steam.

HOW IT SAVES IN UPKEEP: — Condensate flow is even, vapor free, easily handled. No sudden surges of condensate in starting. No hammering, no hard wear and tear on system. Properly engineered for the job, final air temperatures are not excessive; heat easily directed where needed; no flashing of low pressure condensate. Heaters are self-draining on shut-down. Heaters are strongly built; all coils including the condensate drain tubes are hairpin bend, stress relieving. Use thru four heating seasons has proven these advantages in large scale plant heating.

NIAGARA

High Pressure Steam Fan Heater (Patented)



NIAGARA BLOWER COMPANY

Dept. S, 405 LEXINGTON AVE., NEW YORK 17, N. Y.

Please send Bulletin 109 on the Niagara High Pressure Steam Fan Heater.

Name.....

Address.....

LETTERS

TO THE EDITORS

Finding Out Who's Who

May we have 20 or 25 reprints of "Who's Who in Defense" and "Metalworking Facts and Figures" (Jan. 7, pp. 143 and 167)?

E. Carlton
Arthur Andersen & Co.
Chicago

Please send us a copy of "Who's Who in Defense" . . .

Bankers Trust Co.
New York

. . . . would appreciate four copies of "Who's Who in Defense."

W. F. Ferris
Bennett Office Inc.
Minneapolis

. . . would like to have six copies of "Who's Who in Defense" for use by our people.

William H. Texter
Youngstown Sheet & Tube Co.
Youngstown, O.

. . . send us six copies, together with statement.

Frederick M. Weitlauf
Timken Roller Bearing Co.
Canton, O.

. . . would like to get 50 copies of "Who's Who in Defense."

Jehu R. Derriokson
Formed Steel Tube Institute
Cleveland

. . . please send two copies of your excellent feature "Who's Who in Defense."

B. M. Richards
Farrington Mfg. Co.
Boston

Excellent job on this directory ("Who's Who in Defense"). Please send 25 or 30 copies.

P. J. Lahny
National Production Authority
New York

• *These and many other requests for "Who's Who in Defense" have been sent.*

Request from Washington

APPRECIATE BY RETURN WIRE PERMISSION TO REPRINT IN OFFICIAL SENATE DOCUMENT WORLD STEEL PRODUCTION FIGURES ("Metalworking Facts and Figures," Jan. 7, p. 167).

Burnet R. Maybank
chairman, Joint Committee on Defense Production
Washington

• *Permission granted.*

Getting It Straight

We would like to know more about the machine which "Straightens Kinks" (Jan. 14, p. 53).

Irene L. Rice
Hamilton Watch Co.
Lancaster, Pa.

. . . please tell us how to get more information about this machine.

Jane C. Featherly
Monroe Calculating Machine Co.
Orange, N. J.

. . . where may we obtain further details.

S. J. Gwoosh, president
Excel Automatic Products Inc.
Newark, N. J.

• *Write to Mackintosh-Hemphill Co., 901 Bingham Rd., Pittsburgh.*

Unwelcome gusts not admitted!

Let the winter wind rage outside—you've got him thwarted at the threshold when you've got a storm door of steel!

Sturdy and precision-built, this steel guardian forms a perfect seal against the most frigid blasts. It won't warp or sag . . . it resists fire and rust . . . it becomes a summer screen door in a matter of minutes. Better than any other metal, it can be painted to blend with the trim on your house.

This remarkable door provides all these advantages—and at very low cost—because it is steel, America's versatile bargain metal. Like the steel storm sash, gutters and lighting fixtures on this weather-ready house, the steel storm door adds more value . . . and protects the value it adds.

No matter the product—when you make steel your standard, you save.

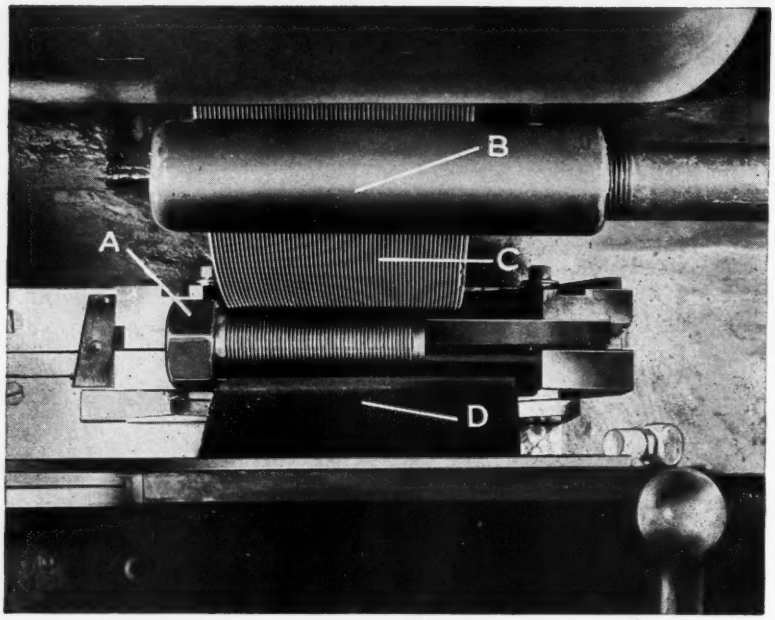
Metal sculpture, executed in Weirzin—electrolytic zinc-coated steel that resists heat, moisture, rust—demonstrates the exceptional workability of this easily fabricated metal.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

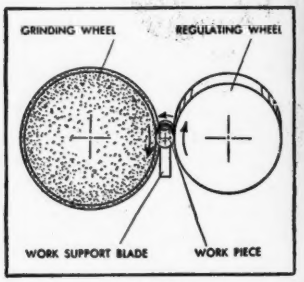
UP-CUTTING

A NEW Centerless Thread Grinding TECHNIQUE

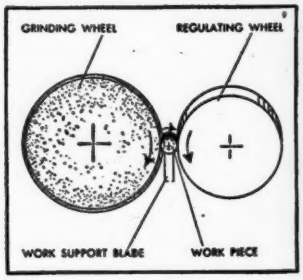


• Engineering research in our laboratories has developed a revolutionary new technique in centerless thread grinding—"up-cutting." The difference between "up-cutting" and "down-cutting," the method generally used for centerless cylindrical grinding and centerless thread grinding, is illustrated diagrammatically below. The new technique is generally to be used for infeed grinding and for large workpieces requiring coarse-pitch threads.

A—Hex-Head Cap Screw; B—Coolant Nozzle; C—Grinding Wheel; D—Regulating Wheel.



DOWN-GRINDING



UP-GRINDING

GREATER WORK SURFACE SPEED—BETTER THREAD FINISH

• In "down-cutting," the surfaces of the workpiece and grinding wheel move in the same direction at the point of contact. In "up-cutting," the surfaces of the workpiece and grinding wheel move in opposite directions at the point of contact. Stresses imposed are reduced and work surface speeds can be used up to 30% greater than for similar "down-cutting" conditions, with fewer wheel dressings. All forces act downward, holding the workpiece firmly on the workrest blade and reducing chattered finishes under heavy cuts. The regulating wheel solely controls work rotation and the end-wise travel in timed relation to its rotation, completely independent of friction between the grinding wheel and the workpiece. Spinning of the work is practically eliminated, especially when grinding coarse threads on heavy workpieces.

Write for Bulletin E-97.

LANDIS Machine CO.

WAYNESBORO • PENNSYLVANIA • U.S.A.

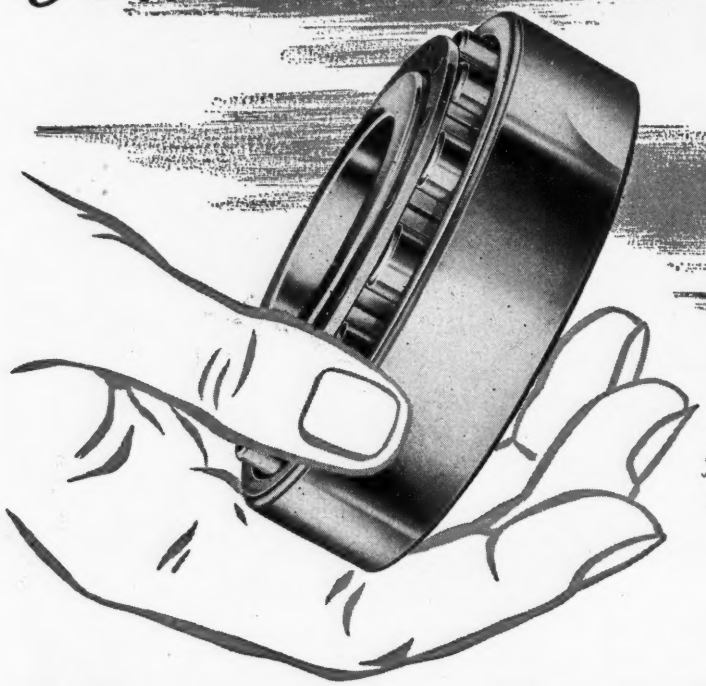
THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

No Scrap Left in Us ?

There'd better be! And there is, *too much of it*, underestimated and overlooked. All it needs are wheels under it, speeded by the knowledge that there can be no more disastrous secret weapons turned against us than our own shut-down metal furnaces. Steel scrap and non-ferrous, both . . . get it *all* rolling back to the mills right now, so the mills can get it rolling back to you, in time. Pass the word to your factory manager to call in your local scrap dealer *today*. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

Approximates Bronze-Retainer Precision



AT STEEL-CAGE COST...

Rollway's Tru-Rol Roller Bearings

Now—approach the trueness and long-life of a high-precision bearing for approximately steel-cage cost. Improve power efficiency and reduce preventive maintenance over ordinary bearings... while conserving the use of critical bronze. TRU-ROL enables you to do all this with only minimum variation from top bearing performance.

That's because Tru-Rol's contoured guide lips assure precision rolling . . . prevent roller skew with its long train of evils . . . sliding friction, end rub, power loss and reduced life expectancy. More—lubrication is evenly distributed over each roller, assuring a *thin* oil film that reduces heating and lowers friction torque.

Nation-wide Replacement Service

Rollway Bearings are available for replacement through authorized bearing distributors in principal cities. To locate, consult classified phone directories under BEARINGS.

SALES OFFICES

Philadelphia — Los Angeles
Pittsburgh — Cleveland
Houston — Chicago
Detroit — Boston

ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

ANOTHER CUSTOMER CONVINCED:

Formbrite cuts polishing time in half

Mirror handle sections are formed on a 400-pound drop hammer from blanks measuring 1⅝" x 8" x .032". Trimmed and soldered, the completed Formbrite handle requires only a light "color buffing" operation—accomplished in half the time previously required for ordinary drawing brass. Handle is soldered to etched mirror back and lacquered to retain its lustrous finish.

ASTORLOID Manufacturing Co., Inc., Bronx, New York, makers of dresser sets and cosmetic containers, asked us point blank: "Just what *is* Formbrite*... and what will it do for us?" We explained that Formbrite is specially processed forming brass with such an exceptionally fine grain that buffing time is substantially reduced. It is stronger, "springier" and has a harder, more scratch-resistant surface than ordinary brass, yet is so ductile that it can be readily formed or drawn. Besides, it doesn't cost any more.

Astorloid's production engineers made a trial run of Formbrite in red brass alloy in their own press and polishing rooms and were amazed at the sharpness of the die impression ... and at the bright lustrous finish which was obtained by a simple "color buffing" operation in half the time previously required.

Millions of pounds of Formbrite sheet, strip, rod and wire have been produced and satisfactorily fabricated into a wide range of products. We'd like to tell you more about the time and money-saving possibilities of this fine-grain metal ... and send you a sample to try on your own polishing wheels. Address The American Brass Company, General Offices, Waterbury 20, Connecticut. 5206

*Reg. U. S. Pat. Off.

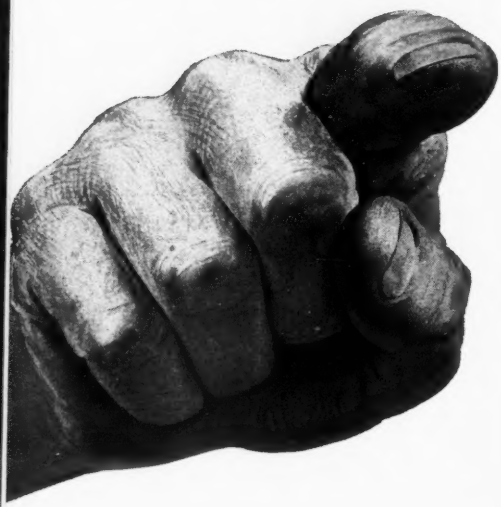
Formbrite Drawing Brass is an

ANACONDA

PRODUCT

made by THE AMERICAN BRASS COMPANY

SOMEBODY pays for the scrap!



These screw machine parts, illustrated full size, are typical of the gas conversion appliances produced by Anderson & Forrester. Note the wide range of secondary machining operations necessary, such as slotting, milling and cross drilling. Some orifices require a No. 80 drill (.0135").

...and by scrap we don't mean the rod ends and chips incidental to screw machine operations—we mean the machined parts that, for one reason or another, wind up in the scrap bins instead of the shipping department. No one can speak with more authority than Anderson & Forrester, Denver, Colorado, manufacturers of gas jets, orifice caps, plugs, pilots and similar natural gas conversion appliances:

"We've been in business 25 years. We make hundreds of different screw machine products—millions of units a year—using over a million pounds of Anaconda Free Cutting Rods. We like these rods because we've always found them to be uniform in temper, dimension, machinability and over-all quality. Recently it was necessary to substitute some rods of a different make. Our operators spotted the difference immediately, complaining of 'hard temper,' excessive scrap and tool wear.

"We don't like to pay for scrap, nor can we pass along the cost to our customers. We depend on Anaconda Rods for the uniformity that gives us maximum tool life and permits us to duplicate standing records of speeds and feeds for long, uninterrupted production runs."

There are 46 Anaconda Copper and Copper Alloy Rods in a wide variety of commercial sizes and shapes suitable for screw machine use. Nineteen are free cutting alloys. Write for a copy of Publications B-14 and B-3, addressing The American Brass Company, General Offices, Waterbury 20, Connecticut.

ANACONDA

FREE CUTTING RODS

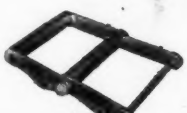
for top screw machine production

no ONE chain serves every purpose

Twelve endless strands of Link-Belt Class H pintle chain - - with pusher attachment every second link - - form a dependable conveying medium for this modern pipe cooling rack.

LINK-BELT offers the RIGHT chain for every job . . . engineered to meet your requirements

Typical chains from the complete Link-Belt line



Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.

Class C combination chain — popular, durable, low cost design for elevators, conveyors.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.

Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

Link-Belt offers no single "cure-all" chain to handle every job. From the most complete line of chains and sprockets—we can recommend the best type to fit your particular requirements—cast, combination, forged and fabricated steel, roller or silent. So, whatever your chain problems, big or small, Link-Belt engineers will work with you or your consultants to help solve them.

LINK-BELT COMPANY, Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

12,513-A

LINK-BELT

CHAINS AND SPROCKETS

"When we need Special-Purpose Drills?...

MORSE,

of course

...same as we specify for ALL Cutting Tools!"

MORSE Cotter Pin Drill. Made with slightly heavier webs than General Purpose Drills. Able to withstand sudden torque and bending. For drilling sheet metal, cotter pin holes in shafting, and poor quality castings.

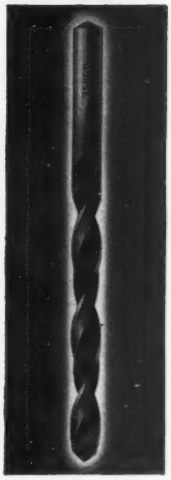
He's right... Morse makes 'em *all*... every type of Special-Purpose Twist Drill you could need.... like these. And Morse works hand-in-glove with your Morse-Franchised Distributor to work out the exact specification of drill-type, diameter, length and twist-cut that will deliver top cutting performance on your particular job, at lowest cost.

That's why it's just plain good business to have your Morse-Franchised Distributor check up on *all* your cutting operations — because "he's the man with the know-how ... the man to *know!*"

MORSE TWIST DRILL & MACHINE COMPANY

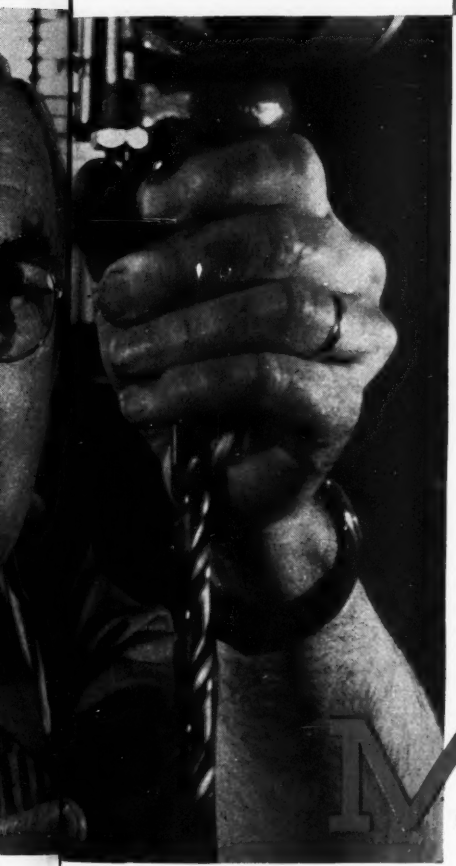
NEW BEDFORD, MASS.
(Div. of VAN NORMAN CO.)
Warehouses in New York, Chicago, Detroit, Houston, San Francisco

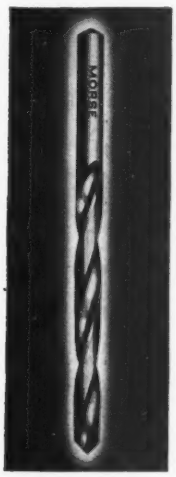
MORSE Brass Drill. Specially constructed with slow spirals; wide, polished grooves and a slightly lower temper for use in soft, nonferrous metals of the brass family.



MORSE Heavy Duty Drill. Made with heavy webs for greater rigidity for use in power-fed equipment. Used in stainless or spring steels, hard cast-iron, monel, and heat-treated metals, near the limit of machinability.

MORSE Quick Twist Drill. Made with a fast spiral and polished flutes for use in aluminum, magnesium and die-cast materials of low tensile strength.





MORSE Plastics Drill. Similar to Brass Drill but with 90 degree points and a special heat treatment to resist abrasion found in drilling bakelite, hard rubber and many molded plastics.

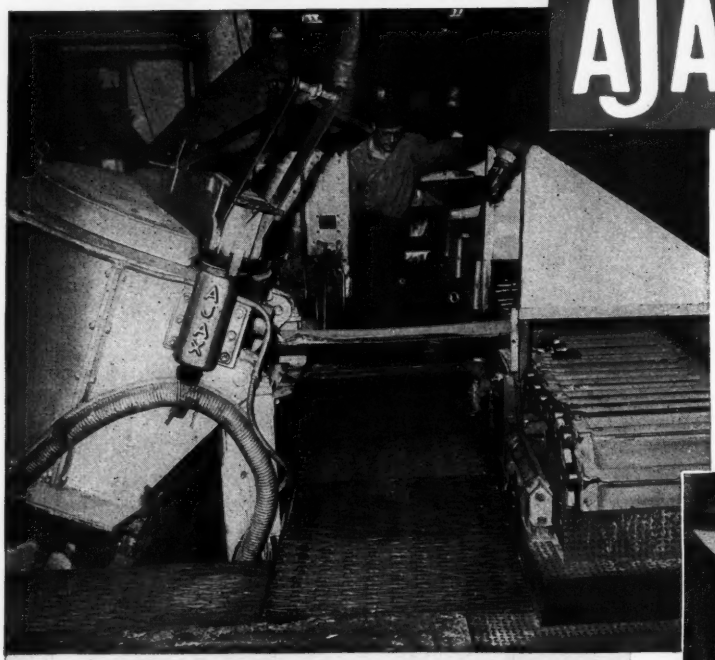
MORSE Ground Flute Ambore Drill. Ground - from - the - solid in the smaller sizes; with polished flutes in the larger. All made with the special Ambore heat treatment for maximum toughness.

MORSE
Cutting Tools

MILLIONS of POUNDS

of Aluminum per year reclaimed with the help of

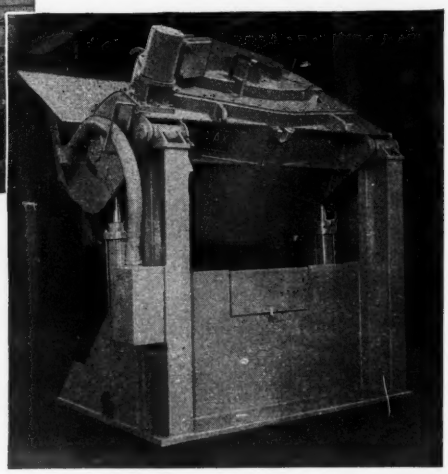
AJAX INDUCTION FURNACES



166 kW AJAX Induction Furnace in tilted position, pouring molten aluminum alloy through a coated trough into ingot molds on conveyor.

MAJOR AUTO MANUFACTURER RECOVERS SCRAP FROM MACHINING OPERATION BY MODERN MELTING PROCESS

Here is an interesting setup for reclaiming aluminum alloy chips, which is installed adjacent to the piston casting setup in one of the largest automobile manufacturing plants in the country. More than half of the aluminum needed for pistons in this plant comes from this scrap recovery program. A considerable net profit is realized, and aluminum purchases are lowered.



Above is a 330 kW furnace. AJAX Engineering Corporation manufactures low frequency electric induction furnaces in a great variety of sizes ranging from 20 to 1000 kW. This type of equipment has been adapted to the full range of non-ferrous metals and alloys.

Send for Reprint of Article on Scrap Recovery by Induction Furnaces

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Teamwork in Pioneering Refractories for Higher Temperatures

The trend in industry is to higher and higher temperatures. In the range of 2800° F. to 3650° F., high-alumina refractories are meeting a wide range of service conditions at low over-all cost.

NORTON... Industry is constantly seeking the answers to high-temperature problems. To meet these temperature ranges, the Norton Company of Worcester, Massachusetts, is producing a line of super-refractories that will stand the gaff. For 36 years, Norton has been pioneering in the field of higher temperatures.

ALCOA... From Alcoa plants come the aluminas that team with Norton and other refractory manufacturers to produce the super-refractories that economically meet these increasing service demands.

ALCOA, too, has pioneered in this field, developing aluminas that give refractory brick and special shapes: Additional strength at high temperatures . . . lower coefficient of expansion . . . higher resistance to spalling and cracking . . . chemical inertness . . . negligible porosity and shrinkage.

ALCOA pioneering will always go forward in partnership with America's leading manufacturers of refractories . . . seeking the answers in terms of aluminas for tomorrow's refractory products. We'd like to help you with your high-temperature problems. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 622B Gulf Building, Pittsburgh 19, Pennsylvania.

Alcoa Chemicals

ALCOA

ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

It's Incredible, but true!

To meet Army Ordnance requirements, we are now *flame-cutting* armor plate to a tolerance of $\pm 1/32$"

THE ACTUAL WIDTH OF THIS SPACE!

What's more, we're attaining this same accuracy—or greater!—on intricate bevels and radii as well as on straight cuts. With the amazing Acetogen Process of flame-cutting, we achieve a precision on armor plate heretofore attained only by machining or machine-grinding—at far less expense, and in a fraction of the time. Thus, we're passing a double saving on to our client—in this case, Philadelphia's Henry Disston & Sons, Inc. *These savings can also be yours!*

A COMPLETE STEEL FABRICATION SERVICE

In our new plant, skilled craftsmen are ready to cut, form, shape, and assemble your defense work the Acetogen way. Send us your drawings *now* for a prompt cost-and-time estimate. Our organization has full security clearance. Write today! Acetogen Fabricators, Inc., 822 Commercial Trust Building, Philadelphia 2, Pa.

ACETOGEN

FABRICATORS, INC.

Originators of precision flame-cutting

NO SCRAP... NO STEEL!

QUALITY
YOUNGSTOWN
SERVICE

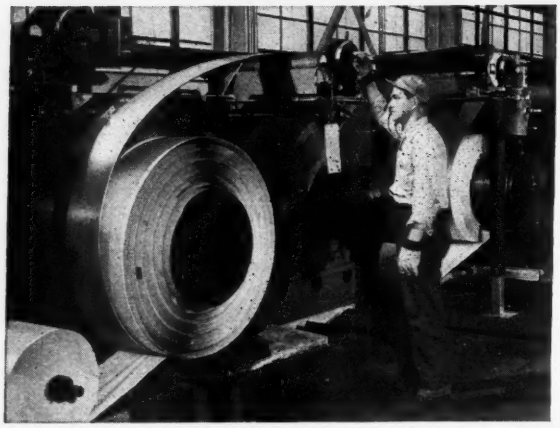
THE iron and steel industry faces a serious scrap shortage, growing more critical every day. . . . It will be impossible for producers to make the steel tonnages demanded for rearmament and essential civilian needs, unless consumers cooperate by furnishing *more scrap*. . . Most desperately needed now is heavy industrial iron and steel scrap. . . . Keep the cobwebs from gathering at your own plant by turning in more of your own scrap today.

The Youngstown Sheet and Tube Company

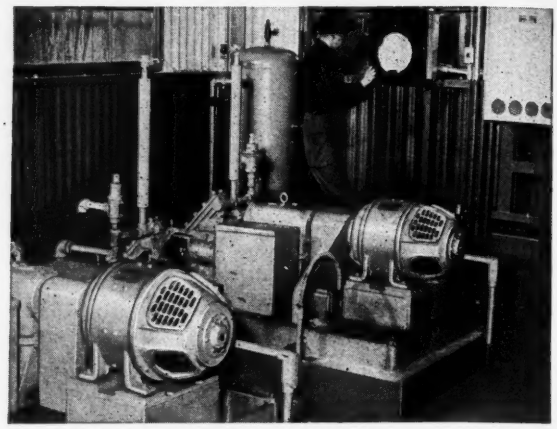
General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

4 WAYS TO HELP KEEP YOUR PRODUCTION ON SCHEDULE

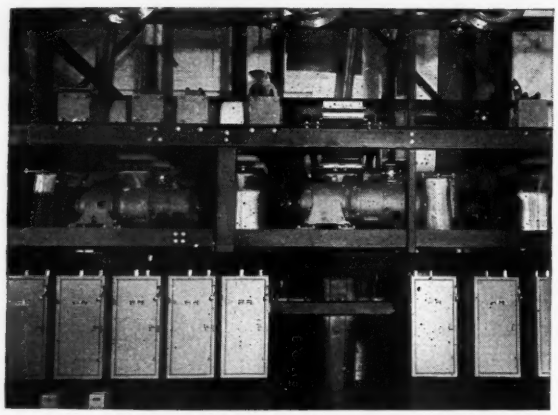


ELIMINATE MANUAL OPERATIONS. If you're winding a continuous strip and constant tension is a problem, this might be an idea you can use. The Wallingford Steel Company recently installed seven G-E Speed Variators on the winders in their strip steel annealing and pickling line. Before, a lot of time was lost in manually adjusting winder speed and tension to compensate for spool buildup. Now? It's done automatically by the Speed Variator. *And* they get a better-wound spool. Ask for Bulletin GEA-5335 on G-E Speed Variators.



MAKE QUALITY CONTROL AUTOMATIC. Perhaps you're finding it difficult to accurately control a chemical proportion operation. Fibreboard Products, Inc. solved this problem by putting a G-E Thy-mo-trol* Drive on a chemical pump which injects a chemical conditioner into process water as it is needed. The trick is to keep the flow of chemical accurately proportionate to the demand—no trick at all for Thy-mo-trol. Ask for Bulletin GEA-5337 on Thy-mo-trol drive.

*Reg. Trademark of General Electric Co.



GO FROM BATCH TO CONTINUOUS. To boost production, more and more companies are switching from batch to continuous operation. This accounts for the great interest in this "junior" bleaching range now being produced by the H. W. Butterworth Co. Its G-E ACA gear-motor drive helps make it flexible, efficient, and economical. Speed control is easily obtained over ranges of as high as 20:1. Ask for bulletin GEA-4883 on ACA motors.

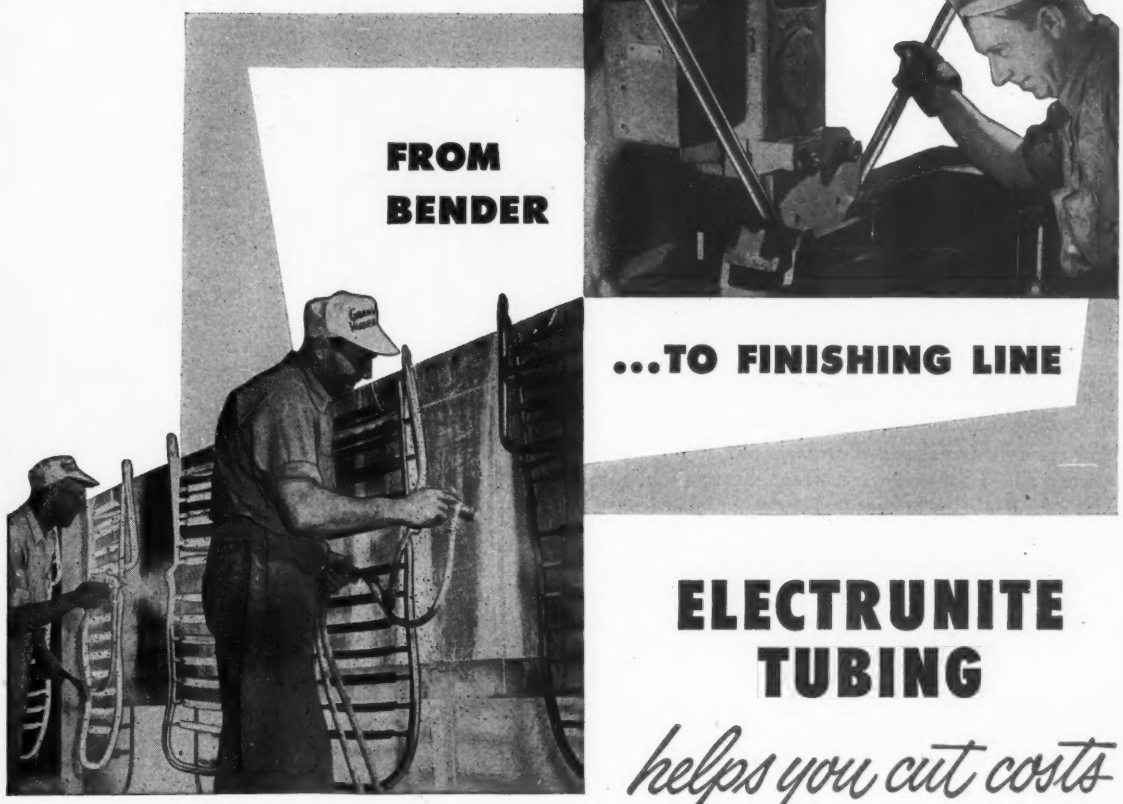
INCREASE MACHINE SPEED to get top efficiency out of your equipment. The J. Bishop Company faced a problem of frequent breakage while drawing wire and tubing thinner than a human hair. This G-E Speed Variator, installed on a vertical bull block, reduced costly breakage to the minimum, turned a complicated process into one simple operation.

To get the bulletins mentioned above, write *Section 646-16, General Electric Co., Schenectady 5, N. Y.* A 26-page manual on electrical adjustable-speed drives in general is also available; ask for Bulletin GEA-5334.

Headquarters for ELECTRICAL ADJUSTABLE-SPEED DRIVES

GENERAL ELECTRIC

646-16



ELECTRUNITE TUBING

helps you cut costs

● Once your fabricating line is set, you can run ELECTRUNITE Tubing hour-after-hour, getting identical bends and shapes. ELECTRUNITE Tubing is uniform in dimensions, uniform in structure, uniform in ductility.

On your finishing line, you apply the finish to the clean, homogeneous surface of ELECTRUNITE Tubing. Whether it's painted or plated, there's no problem of adjusting finishing procedures from piece to piece to get uniform product finishes.

Let us tell you about Republic ELECTRUNITE Tubing . . . and about our Republic 3-Dimension Metallurgical Service that combines the knowledge and experience of field, mill, and laboratory metallurgists to help you.

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
224 EAST 131st STREET • CLEVELAND 8, OHIO

FREE BOOKLET
Write for Booklet SPD-52 ... contains data and case histories on ELECTRUNITE Tubing applications.

Republic REPUBLIC STEEL
ELECTRUNITE TUBING

Made by the fabricators of ELECTRUNITE Boiler Tubes... the *original* electric-resistance-welded pressure tubes

You don't need to worry about tubing service, when you have

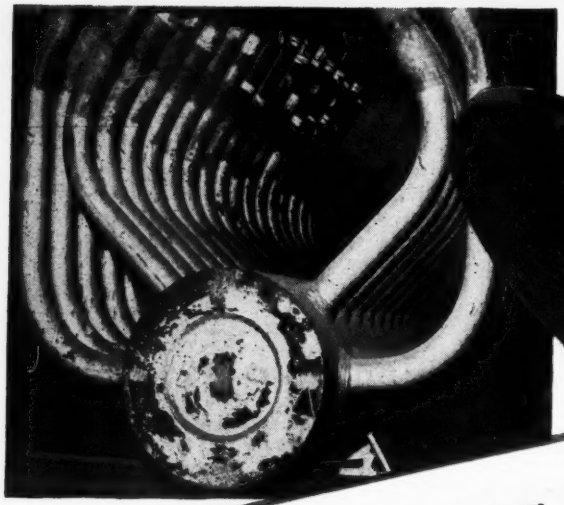
National Seamless Alloy Steel Tubes

With conditions as they are today, it's good to know that you have NATIONAL Seamless in your equipment. Nothing brings more satisfaction than the feeling of security that comes with your having made the wise decision to use the most reliable materials at the time of installation.

Now more than ever, the advantages of National processes come to light, when additional strain and stress accompany the grueling operations in today's feverish race to produce—and to produce more and more—of essential products or services.

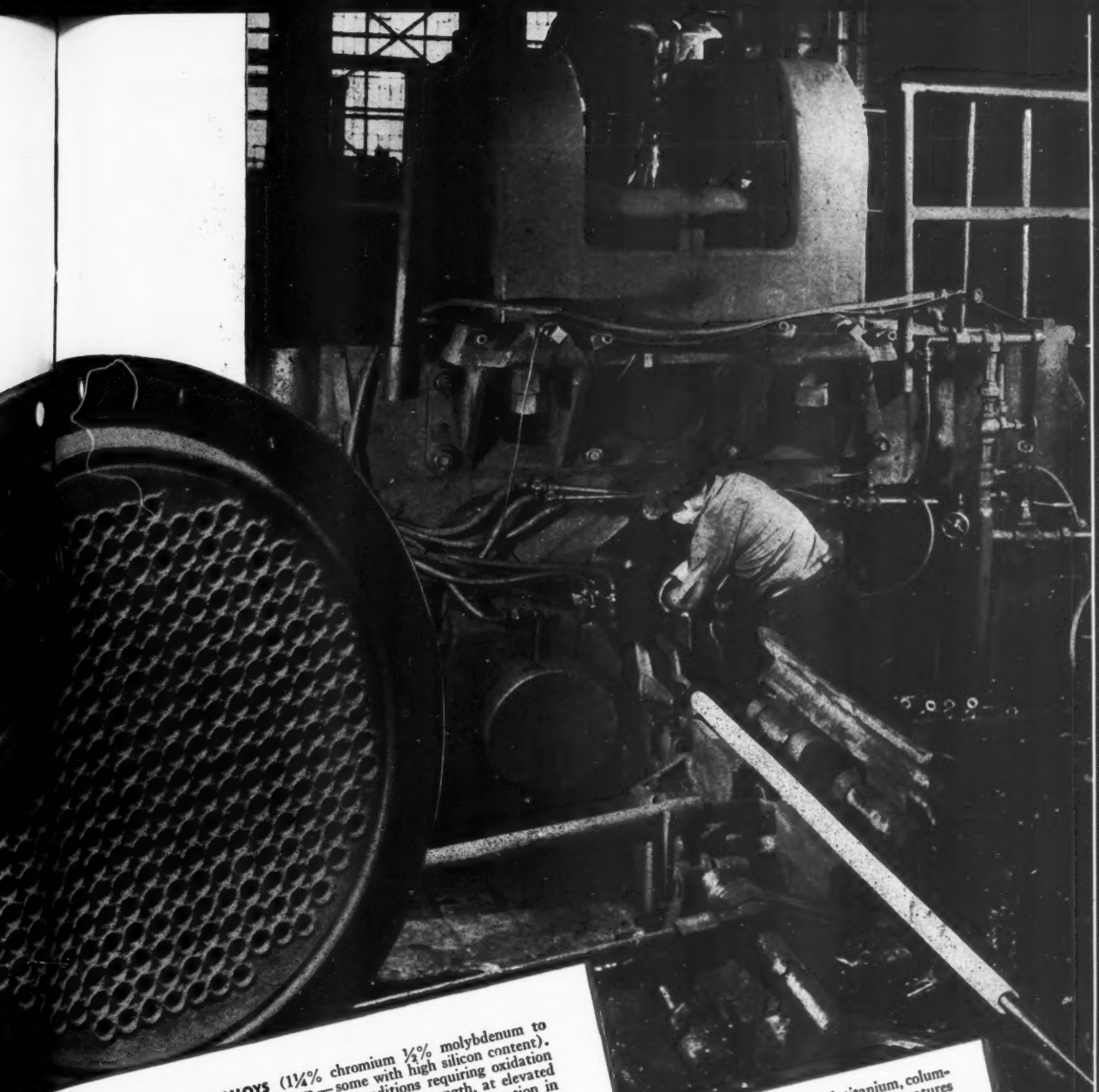
The logic of experience is always convincing, so it's a good time right now to make note of the old axiom "the best is cheapest in the long run," and when the time comes again to make replacements and repairs to equipment that has given honorable service and "more than paid for itself," you will want to say again "use NATIONAL Seamless—America's preferred seamless pipe and tubes."

NATIONAL TUBE DIVISION
UNITED STATES STEEL COMPANY, PITTSBURGH, PA.
(TUBING SPECIALTIES)
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



LOW NICKEL ALLOYS (3½% and 5% Nickel). These alloy steels are widely used where high impact resistance at sub-zero temperatures is desired. Additionally, they are used to combat general corrosion by neutral salt solutions such as sodium and potassium nitrate or sulphate. They are also advantageous in minimizing caustic embrittlement—a special type of corrosion occurring when stressed carbon steel is in contact with hot alkaline solutions. Soda and Kraft paper mills find these nickel steels give increased performance over plain carbon steel in black liquor evaporators.

MEDIUM CHROMIUM ALLOYS (5% chromium ½% molybdenum to 9% chromium 1% molybdenum—some with titanium addition or high silicon content). These alloys have oxidation resistance and strength characteristics at high temperatures similar to the low chromium alloys. Corrosion resistance, particularly to sulphur compounds such as SO_3 and H_2S, is generally appreciably better than that of the lower chromium alloys, hence they find application where the latter group does not afford sufficient increase in service life.



LOW CHROMIUM ALLOYS (1¼% chromium ½% molybdenum to 3% chromium 1% molybdenum — some with high silicon content). Principal applications are for service conditions requiring oxidation and corrosion resistance, as well as reasonable strength, at elevated temperatures. These alloys are used to resist rapid deterioration in service involving hot corrosive gases in many industrial applications.

U·S·S STAINLESS STEELS (18-8 and modifications with titanium, columbium or molybdenum). These alloys resist oxidation at temperatures up to 1500°F; they also exhibit excellent strength combined with high ductility and impact resistance, together with maximum corrosion resistance, at all temperatures from the lowest obtainable up to above 1500°F. They find wide application under the most severe service conditions in the heavy chemical industries, including the related fields of petroleum refining and paper making. They are extensively used in food processing, dairy and beverage industries, and drug preparation to avoid taste and color contamination. Their general corrosion resistance makes them useful in the field of plastics preparation, fabric dyeing, and numerous others.

WALLS WITHOUT WELDS

USS

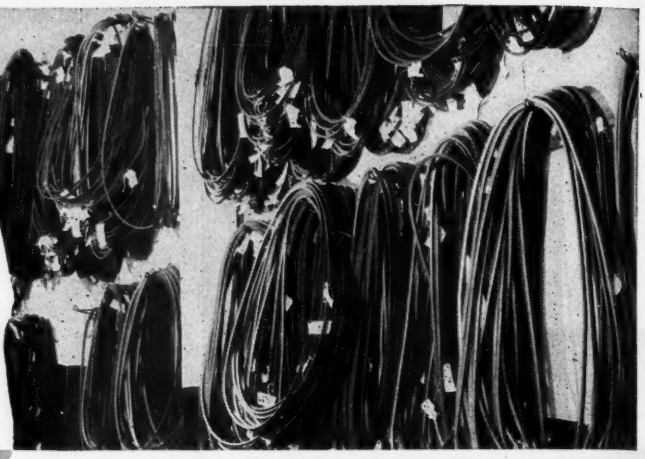
U·S·S NATIONAL SEAMLESS

ALLOY STEEL TUBES

UNITED STATES STEEL

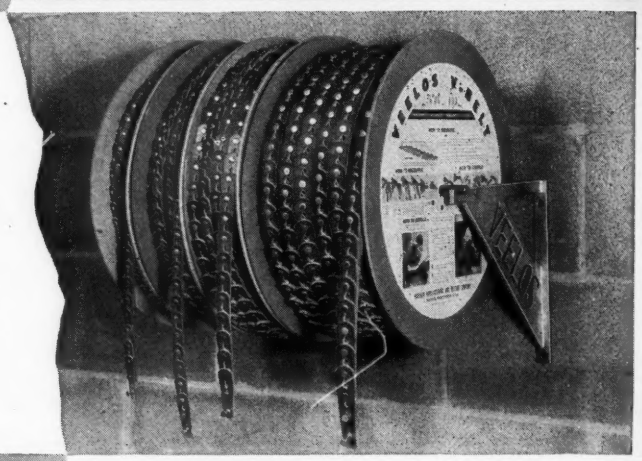
Why carry this Costly Inventory?

When you switch to Veelos—the adjustable v-belt—you end for all time the storage problem, the inventory control problem and the "frozen investment" problem that come with carrying this expensive, space-wasting stock of endless v-belts.



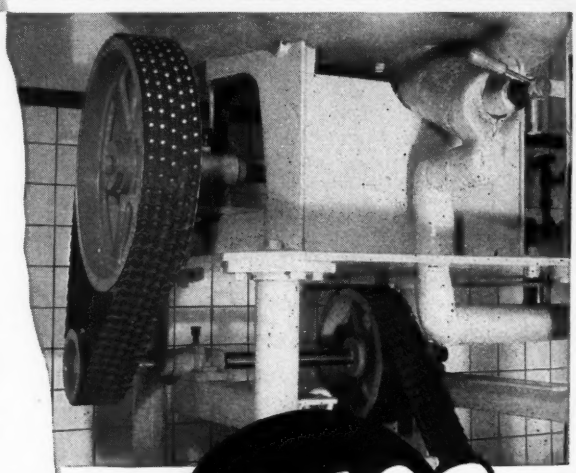
4 reels of *VEELOS* is your Complete Inventory

With just these 4 reels of Veelos you can take care of *every* v-belt need in the O, A, B and C widths—these 4 reels replace up to 316 sizes of endless v-belts . . . and you have the right size belt when you need it. There's no storage or control problem—inventory costs are at a minimum.



and *VEELOS* provides Peak Machine Production

Vibrationless, full power delivery—simple, easy adjustment to maintain uniform tension on all belts—quick installation (unnecessary even to dismantle outboard bearings) these are Veelos advantages that mean maximum production.



We have a copy of the VEELOS DATA BOOK

for you—write today and we'll send you this complete story on Veelos—the adjustable v-belt.

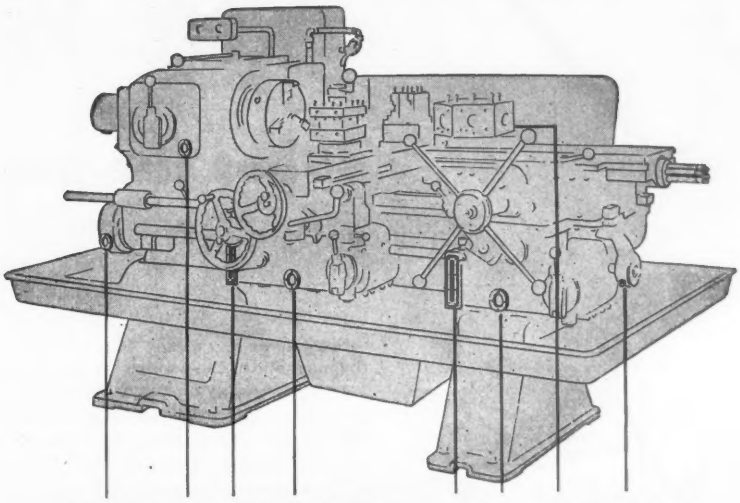
VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Iso double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

MANHEIM MANUFACTURING & BELTING COMPANY • MANHEIM, PENNA.

another reason why J&L turret lathes produce { *MORE CHIPS PER TOOL*
MORE PIECES PER HOUR
MORE PROFIT PER JOB

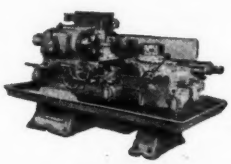


JUST A FEW SPOTS TO WATCH!

FEWER FITTINGS NO GREASE CUPS AUTOMATIC LUBRICATION

MORE EFFICIENT LUBRICATION!

Proper lubrication of J&L Turret Lathes depends very little on the operator or maintenance crew. This saves the operator's time and *cuts your maintenance costs.* The gears run partially submerged in oil, and independent pumps supply fresh, clean oil under pressure to *all sliding bearings.* Metering pins at each lubricating point assure distribution of the *proper amount of oil to each individual bearing.* Oil is pumped in direct relation to the spindle speed. This means that in High Velocity Turning with carbide tools—*when more lubrication is required—more oil is delivered.*



P.S. ***This simple, built-in lubrication system guarantees your investment. Write to Dept. 710 for Catalog.***

"World's most accurate and powerful turret lathes"

RAM TYPES: Bar, 1½" to 4½", Chuck, 10" to 12". SADDLE TYPES: Bar, 2½" to 5", Chuck, 12" to 18".

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. J&L TURRET LATHE DIV.

Here's what we're doing

about the steel wire situation:

FIRST, of course, we're pushing production to the very limit.

Second, we're working with you, the user, to help you get the most out of the wire you're getting. Here's what we mean:

If you're having steel wire trouble, turn your problem over to our metallurgists. They've tangled with just about every problem in the history of wire fabrication. A problem that is totally new to you, may be a simple matter of recorded history for us.

For example: You may be using a wire that's unsuitable for the job it has to do. Perhaps a different grade can be used that will give the desired performance. Maybe your fabricating techniques can be improved, resulting in more uniform physical properties and less scrap.

You may be able to improve your product and actually cut your costs at the same time. We've seen that happen plenty of times.

In any event, if you have a wire problem, we'll be glad to give you all the help we can. We've always offered this service, but we think it's particularly valuable now.

UNITED STATES STEEL COMPANY
AMERICAN STEEL & WIRE DIVISION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN MANUFACTURERS WIRE

AMERFINE—*High-quality fine wire.*

AMERSPRING—*music steel spring wire.*

AMERLOY—*alloy heading wire.*

AMERTEMP—*heavy-duty oil-tempered wire.*

AMERHEAD—*uniform heading wire.*

AMERSTITCH—*extra-tough metal stitching wire*

U·S·S AMERICAN MANUFACTURERS WIRE

USS

UNITED STATES STEEL

Solve the need for

SPOT HEAT

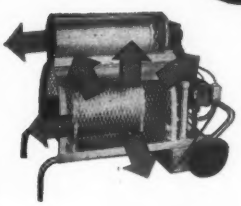
INSTANTLY!

Whenever, wherever you must provide temporary, emergency heat, you can depend on Silent Glow's Model RF to do an effective, economical job to insure more comfortable working conditions in winter weather . . . de-ice equipment . . . preheat areas.

Easy to transport, just wheel the unit where you want it . . . easy to operate, just flick the switch (no torch, match or open flame required). In five minutes you'll have all the heat you need. Unit delivers 168,000 BTU per hour.

SAFE . . . all moving parts and heated surfaces fully protected . . . unit cannot be tipped over accidentally . . . fire goes out immediately when switch is snapped off or power is shut off. CLEAN . . . burns without soot, smoke or fumes . . . no carbon monoxide or unburned hydrocarbons. ECONOMICAL . . . low original cost, low operating cost . . . 100% utilization of fuel, uses No. 2 fuel oil.

Mail coupon today for complete information about the Model RF and other Silent Glow Portable Heaters.



Two kinds of heat . . . radiant . . . forced air by means of auxiliary fan.

More than 10,000 Silent Glow Heaters on duty in the United States and abroad . . . approximately 100 functioning perfectly in Alaska's extreme temperatures.

Use the MODEL RF to —

- Provide more comfortable working conditions in warehouses, machine shops, on loading platforms and docks . . . for outdoor repair crews, etc.
- De-ice vehicles, machinery, ship decks, etc.
- Pre-heat freight cars, engines, etc.
- Thaw frozen transmissions, wheels, gears, etc.
- And for a wide range of other applications where it is important to provide spot heat.

SILENT GLOW HEATERS

PORTABLE

Manufactured by pioneers in the oil burner field.

To: THE SILENT GLOW OIL BURNER CORP.
857 Windsor Street, Hartford 5, Connecticut

Send us the complete story about Silent Glow Heaters.

Name _____

Company _____

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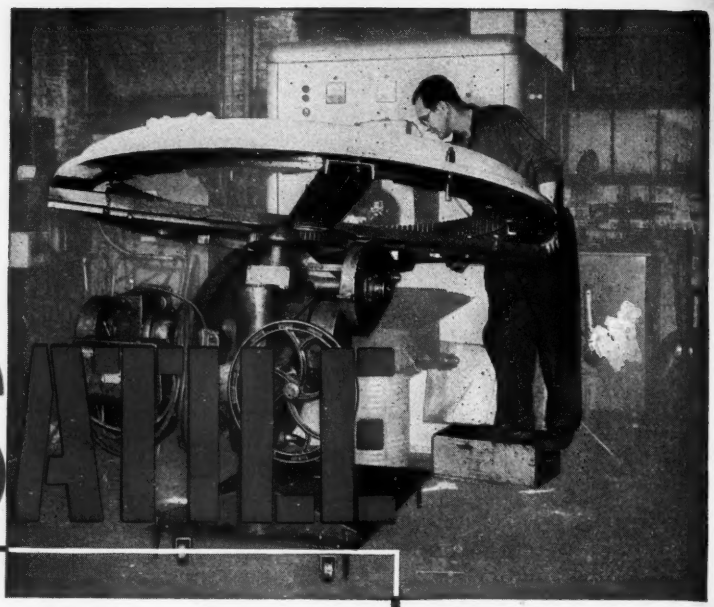
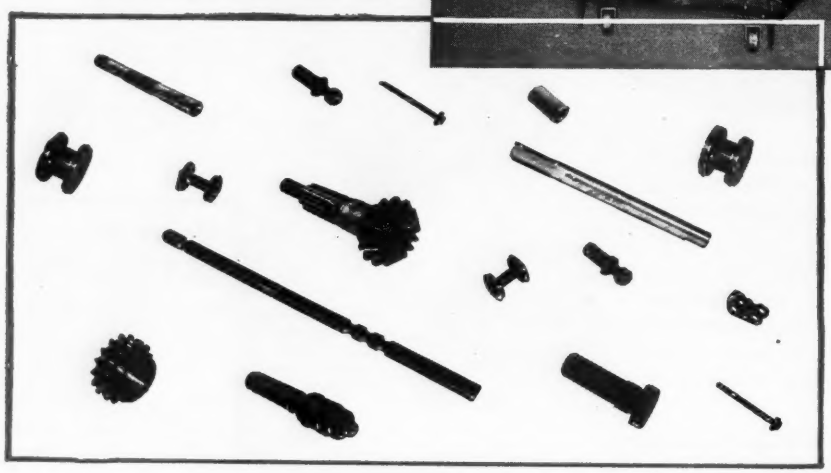
68H51

VERSATILE



"Internal ring gear being hardened on the Lindberg LI-25 Induction Heating Unit".



Investigate the amazing versatility of the Lindberg Induction Heating Unit—approximately 2000 different parts have been selectively hardened or annealed on this typical commercial heat treating installation.

FROM THE LARGEST—The internal ring gear illustrated above—with a 60" inside diameter, 3½" face with 187 teeth each individually heated and oil spray quenched.

TO THE SMALLEST—This small 2" stamped metal rocker arm was selectively heated and water quenched on the small square face at the rate of 3000 per hour. Investigate this versatile Lindberg Induction Heating Unit—it may supply the answer to your selective heating operations.

SPECIFY LINDBERG

for any heat treating or melting need! Lindberg manufactures every type and many sizes of melting and heat treating furnaces from tiny laboratory units to mammoth field erected installations—whether it's gas, oil, electric, arc, low or high frequency—consult your local Lindberg Office!

LINDBERG
HIGH FREQUENCY DIVISION

LINDBERG ENGINEERING COMPANY 2441 W. Hubbard Street, Chicago 12, Illinois

Reynolds
ALUMINUM REPORTER

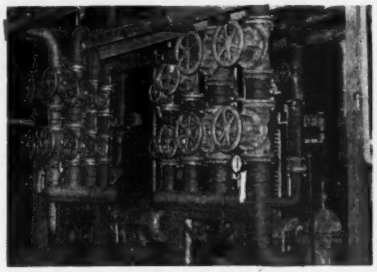
★ ★ ★ Eighth in a Series to Industry on Aluminum Uses and Developments ★ ★ ★

ALUMINUM INVALUABLE FOR STRUCTURAL DESIGN

Aluminum Fills The Bill For Chemical Piping Systems

Piping engineers, always on the lookout for more serviceable materials, have found that aluminum is highly desirable for a growing list of applications. It leads to substantial savings as well, in some instances.

A new aluminum piping installation in the Spencer Chemical Company's plant at the Indiana Arsenal, near Charlestown, Indiana, offers an interesting example of the advantages that aluminum can provide.



Spencer's "Spensol", a solution used in the manufacture of mixed fertilizers, is the fluid conveyed. It consists of ammonia, ammonium nitrate and water. The temperature of this highly corrosive fluid is 100° Fahrenheit at a pressure of 75 psi. Tube-Turn welding elbows, tees, forged flanges and Van Stone stub ends of 3S-F aluminum were employed in the fabrication of the piping to obtain corrosion resistance, efficient flow conditions and prevent leakage of this volatile product.

Spencer's engineers, noted for their prudence and progressiveness, specified aluminum because: (1) its properties are adequate for the temperature of the fluid; (2) the metal will resist the attack of the corrosive agents; (3) it can be welded with inert gas, and (4) the cost of the materials is moderate and represents an investment in long life.

For further information on how aluminum can benefit your business, call the Reynolds Office or distributor listed under "Aluminum" in your classified telephone directory. Or, write the Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

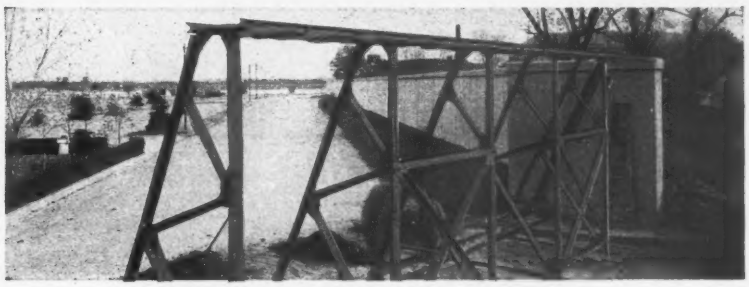
Reynolds Salutes Engineers During Week of Feb. 17-23

February 17-23 is Engineers' Week under the sponsorship of the National Society of Professional Engineers. Today, with the defense of our nation the watchword, we realize how valuable this man with the slide-rule is to the very life of our country.

Strength, Mobility Important Factors in Designing With Aluminum, Actual Case Histories Show

Most progressive engineers are becoming increasingly aware of the importance and desirability of using aluminum in present and future designs. The strength and light weight of aluminum are also important factors to consider for many structural purposes.

Whether in fixed structures or in those designed for mobile use, aluminum's advantages are readily apparent. The new technical handbook, "Aluminum Structural Design", gives several interesting examples of the wide variety of uses to which aluminum can be put.



Portable aluminum closure for flood wall openings.

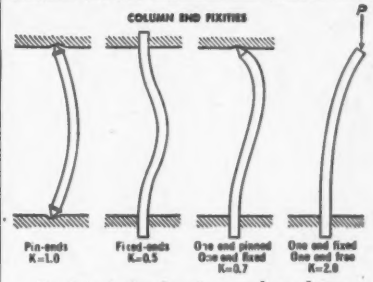
The structure in the photograph above plus lightweight aluminum panels to complete the concrete wall at roadway openings, can be erected in approximately a half hour. All the structurals and panels are stored nearby and the only assembly is joining the prefabricated structural elements with tie pieces.

Upright Scaffolds Co. photo.

This portable scaffolding can be erected to several stories in a very short time. Lightweight aluminum simplifies transportation. Structural aluminum proves ideal for this purpose and others of like nature...television and radio antennas, machinery and equipment dollies, truck trailer bodies, etc.

From a purely technical standpoint, the new "Aluminum Structural Design" is extremely valuable. For example, data presented in this book should enable the engineer to design an original structure of aluminum, or to convert an existing structural design from some other material to aluminum.

Complete information is presented on mechanical properties of aluminum alloys plus a comprehensive discussion of structural design and fabricating considerations. Especially valuable are the formulas and tabular data.



Book includes drawings such as above.

Information contained in this book, as well as others in the Reynolds Library of Technical literature, may give you an idea how the proper use of aluminum may improve your product design or manufacturing process. Why not write now for your *free* copy of this handbook, "Aluminum Structural Design", as well as a complete list of other design and fabrication material available? Please send your request on business letterhead, otherwise price of the book is $1.00.

And for help with any *immediate* problems on the fabrication or design of aluminum, consult the Reynolds Aluminum Specialists waiting to work with you. Call the Reynolds office or distributor listed under "Aluminum" in your classified telephone directory. Or, write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

MORE INTERESTING NEWS ABOUT ALUMINUM ON NEXT PAGE

(Advertisement)

Printed in U.S.A.

(Continued From Preceding Page)

Four-Part Sheet Approved For Military Packaging

Reynolds Metals Company has announced government approval of the new four-part sheet, RM-112. This improved packaging material consists of four materials stoutly bonded with special adhesives.

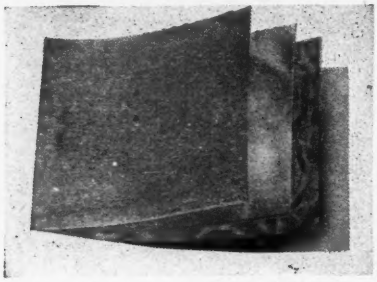


Photo showing construction of RM-112 four-part sheet.

An improved and tougher version of Reynolds RM-101, the new sheet is constructed in the following manner: Scrim backing provides toughness, the plastic film gives flexibility, the .001 Reynolds Aluminum Foil means perfect moisture-vapor and water-vapor protection and the vinyl sheet furnishes perfect sealing.

This is the ideal barrier for protecting motors, generators, electronic equipment and other military items packaged by the "Floating Barrier Method"—specification approved as Type II material under AN-B-20, Barrier, Flexible Sheet Moisture Vapor plus Exhibit 618 and Class A, Type I material under MIL-B-131A, Barrier-Material; Water-Vapor Proof, Flexible.

Upon request, free samples are available to manufacturers and converters for preparing their qualification samples. This applies not only to RM-112, but to other Reynolds Military Barrier materials: RM-240, approved under JAN-P-117, type II (replacing AR-61); RM-260, approved under JAN-117, type I (replacing AR-63); RM-201, currently being used for dehydrated soup packages in rations.

Call the Reynolds Office listed under "Aluminum" in your classified telephone directory. Or, write to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

Aluminum Roofs and Buildings Cut Heat, Increase Efficiency

Industry can take a tip from farmers on reducing the inside temperature of buildings. Proof of this was offered by John L. McKitrick, Agricultural Consultant, in a recent speech before the American Society of Agricultural Engineers.

Mr. McKitrick showed that it can take three times as much feed to put 100 pounds weight on a hog at 85° as it does at 60°. Through use of aluminum roofs and buildings on the farm, temperatures during the summer can be lowered as much as 15° inside.

If reduction of summer heat can increase efficiency for farm animals, it is entirely conceivable that it can increase human efficiency. When designing building products or new plants and additions, consider the many advantages of aluminum—heat and light reflection, no rust, low maintenance, long life, lightweight, ease of fabrication and erection.

Aluminum Perfect Answer to Poultry Processing Problems

Gordon Johnson Company Calls on Reynolds Aluminum for Sanitary Advantages in Poultry Processing Equipment

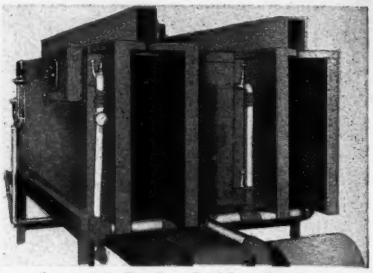
"The processing of poultry, with its attendant factors of blood, viscera, the constant use of steam and boiling water creates equipment problems which can be answered only through the use of aluminum," says the Gordon Johnson Company of Kansas City, Missouri.

Designers and manufacturers of equipment for the poultry industry, this company has solved its problems of material for such equipment through the use of easy-to-clean, sanitary, Reynolds Aluminum sheeting.

The machine illustrated shows the extent to which aluminum sheet is used for "skins" or coverings. Rust and corrosion resistance are the obvious advantages in this application, but lightweight, easy fabrication and rugged dependability also commend aluminum over other materials.

Marsh Steel Corporation, the Reynolds distributor in North Kansas City, Mo., Denver and Colorado Springs serves the Gordon Johnson Company on aluminum requirements for this machine and also for gizzard processing and other equipment.

If this use of aluminum to solve a design problem suggests a way in which aluminum can benefit your products, why not contact the Reynolds Office or distributor listed under "Aluminum" in the classified telephone directory? Or, write to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.



Automatic Poultry Scalding Machine

Polychromatic Finishes With Reynolds Aluminum Non-Leafing Pigment Cut Costs, Improve Appearance!

Aluminum pigmented coatings are usually thought of as producing the typical silvery surface associated with aluminum. This is accomplished with "leafing" aluminum pigment when the aluminum "flakes" in the vehicle rise to the surface to present a brilliant, uniform aluminum sheen.

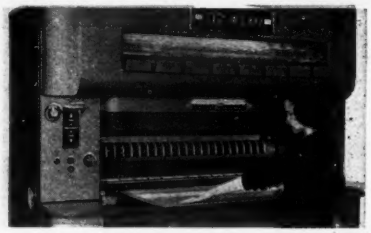
By special processes, patented by Reynolds Metals, this "leafing" characteristic can be eliminated. The resulting "*non*-leafing" aluminum pigments do not rise to the surface but remain evenly dispersed in the lacquer or enamel as it sets up. The randomly oriented flakes catch light at different angles to produce an effect of both depth and iridescence.

There are three types of Polychromatic finishes available to you for your products, regular, hammer and wrinkle type finishes.

"Regular" type is the most iridescent of the polychromatic finishes now in such great demand for automobiles. Either translucent enamel or lacquer may be used as a color base.

"Hammer" type finish is so called because of its resemblance to the effect achieved by ballpeen hammering. This surface is widely used to obtain a smooth, easily cleaned surface with multi-colored effects. The translucent coating is formulated to automatically produce a "crater" or "hammered" effect during drying. It will hide minor surface defects and blemishes. A typical application is window air conditioning units such as the one shown in the preceding column.

"Wrinkle" finishes are widely used for a glare-free surface on reproduction machines and other office equipment. Reynolds non-leafing aluminum pigments are combined with opaque enamels to achieve defect-hiding properties without buffing or sanding. The wrinkle effect is produced by a short baking operation.



Take advantage of Reynolds experience in the industrial finishes field. Reynolds technicians will be glad to work with you and your finishes supplier to achieve just the right polychromatic finish for your product. For a copy of the FREE four-page brochure telling more about polychromatic finishes contact the Reynolds Office listed under "Aluminum" in your classified telephone directory. Or, write the Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

REMEMBER . . . *aluminum* is the only mass-produced material that costs less now than before World War II!

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ALKALINE DERUSTING COMPOUND 134

FAST ALKALINE PICKLE FOR IRON

Derusts and pickles steel, cast iron, alloy steels, tin coated steel, high carbon steels without any etching, darkening or attack on the base metal. Operates at room temperature. Fast action. No acids used. Ideal for reclaiming of tools, gears, fixtures and preparing work for plating, galvanizing, tinning painting and enameling.

ALUMOX "44"

SIMPLE COLORING PROCESS FOR ALUMINUM

Colors aluminum and its alloys many shades of gold, green, brass, yellow, blue . . . in seconds to minutes. No electric current needed. Bulk work easily processed. Send samples of your work to Enthone for coloring to see these beautiful finishes.

WRITE FOR BULLETINS ON THESE PRODUCTS AND A CHECK LIST OF LITERATURE ON SIXTY PRODUCTS FOR MODERN METAL FINISHING.

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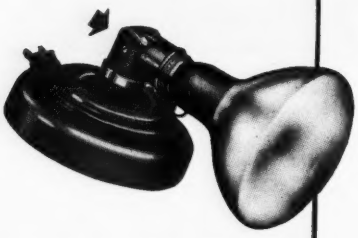
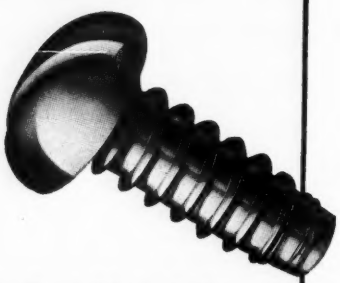
ELECTROPLATING CHEMICALS

This man can show you . . .

How to replace "*specials*" with *standards* to speed assembly



Assembly costs were lowered 35% by using two standard P-K Type Z Screws to fasten plastic socket to metal base of this lamp, and also to serve as pivots permitting 180° sweep of socket. Both screws are driven into a concealed coil spring which has same pitch as screw thread, avoiding special screws.



Type Z, one of five standard types of P-K Screws—also available with Phillips Recessed Head.

Ask a P-K Assembly Engineer how you can simplify and speed up your assembly operations by using *standard* Self-tapping Screws instead of hard-to-get "specials". Since P-K makes a complete line, chances are one of the several *standard* types of P-K Self-tapping Screws will meet your needs exactly.

With the experience of more than a million applications to guide him, he can quickly find the answer to this, and other questions you may have about making your assemblies better, faster, and at lower cost.

Today, more than ever, the P-K Assembly Engineer is a good man to have on your production team, helping you boost output and hold down the lid on costs. He'll call at your request. Parker-Kalon Corporation, 200 Varick Street, New York 14.

Your INDUSTRIAL SUPPLY DISTRIBUTOR . . . *your local source for P-K Screws . . . works side by side with the P-K Assembly Engineer. Their combined efforts are solving many difficult problems of planning and procurement. Let them help you.*

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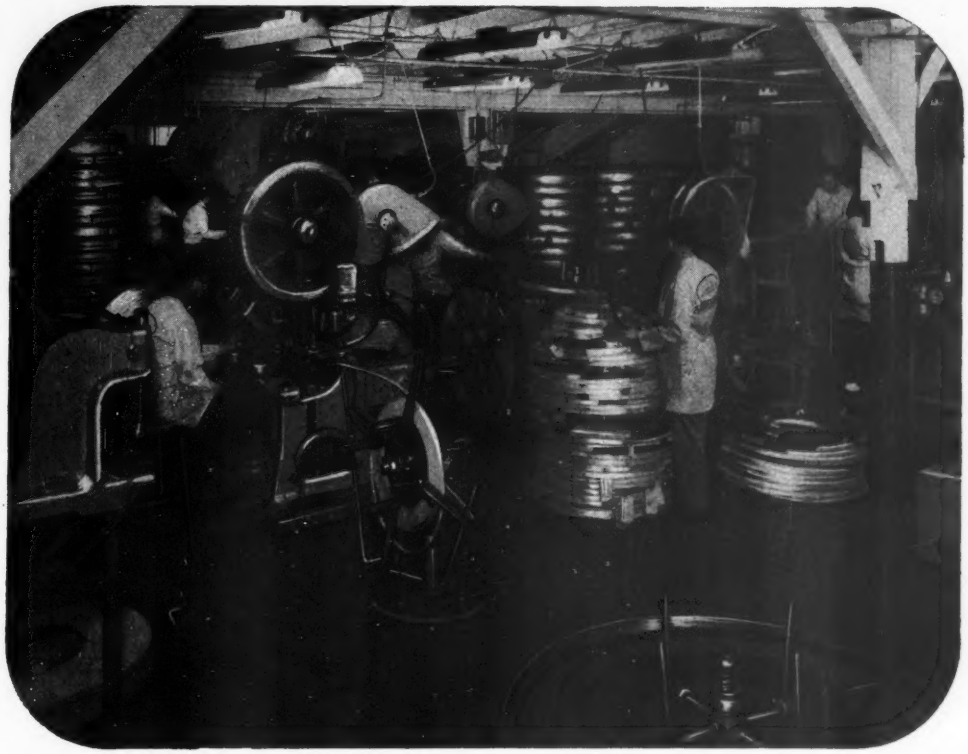
The Original **SELF-TAPPING SCREWS**

FOR EVERY METAL AND PLASTIC ASSEMBLY

FLAT SPRING STEEL



You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

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ALLOY STEEL UNNECESSARY!

COSTS CUT IN HALF
Excellent
WEAR RESISTANCE
Obtained...
with GROUND and POLISHED
STRESSPROOF
STEEL BARS
In this Kearney & Trecker new Model CK vertical milling machine, the 2" diameter feed screw (right) is made from Ground and Polished STRESSPROOF

THREE OPERATIONS ELIMINATED

- QUENCHING
- TEMPERING
- STRAIGHTENING

Ground and Polished STRESSPROOF has been used for lead and feed screws by Kearney & Trecker since 1939. If STRESSPROOF were not available, they would need a .50% carbon-alloy steel to obtain the required strength and wear-resistant properties. The substitution of alloy would require quenching, tempering, and straightening—operations not necessary with Ground and Polished STRESSPROOF. The cost of the part would be more than doubled.

For precision work, lead and feed screws for machine tools must maintain their accuracy through years of operation. Ground and Polished STRESSPROOF cuts cost for these exacting parts because it provides *five* qualities in the bar—(1) *high strength,* double that of ordinary cold-finished shafting; (2) *machinability,* fully 50% better than heat-treated alloys of the same hardness; (3) *high resistance to wear,* replacing many heat-treated or carburized alloys; (4) *minimum warpage,* obtained by special processing; and (5) *accurate, finely ground surface.*

It is significant that the only suitable substitute for STRESSPROOF is an alloy steel requiring many additional expensive production operations.

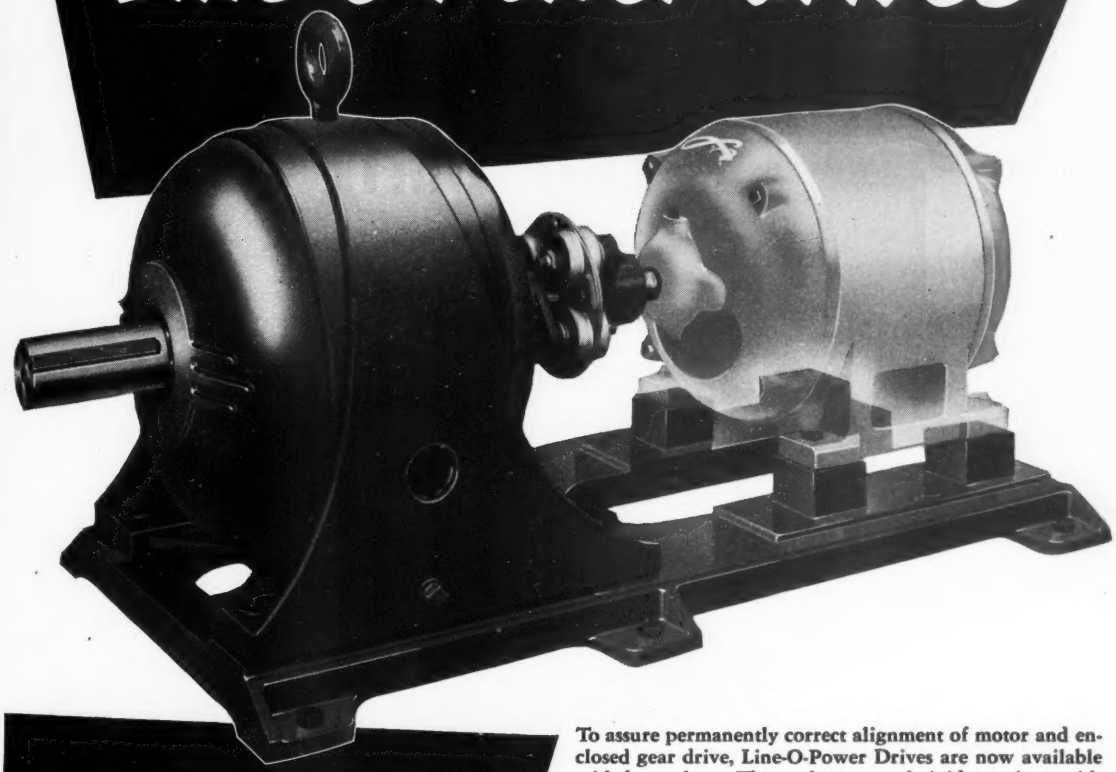
STRESSPROOF
IS PLAYING A VITAL ROLE
IN NATIONAL DEFENSE!
A very large proportion of STRESSPROOF production, today, is going into defense jobs. However, sample bars are available for testing purposes.

La Salle STEEL CO.

1414 150th Street, Hammond, Indiana

Manufacturers of the Most Complete Line of Cold-Finished and Ground and Polished Bars in America

Line-O-Power drives



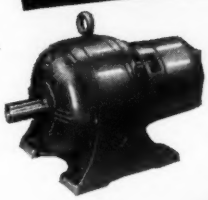
PACKAGED WITH BASE PLATE AND COUPLING

READY FOR INSTALLATION OF YOUR OWN MOTOR

To assure permanently correct alignment of motor and enclosed gear drive, Line-O-Power Drives are now available with base plates. These plates are of rigid cast iron with smooth surfaces and rounded corners, making an attractive installation. Their use assures rapid assembly of units and prevents misalignment of shafts.

Faces of lugs on which unit and motor are mounted are precision machined, and bolt holes are accurately drilled and spaced.

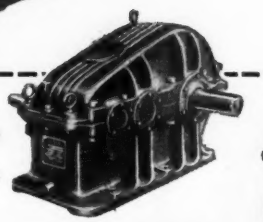
Line-O-Power straight line helical gear drives with Duti-Rated high hardness gears offer economy in original cost and economy in operation. They are available with or without base plates for prompt delivery. Write for prices and complete information or see the Foote Bros. representative near you.



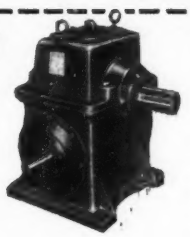
Foote Bros.-Louis Allis Gearmotors

FOOTE BROS.

Better Power Transmission Through Better Gears



Maxi-Power Helical Gear Drives



Hygrade Enclosed Worm Gear Drives

Foote Bros. Gear and Machine Corporation
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Please send me Bulletin LPC containing complete information on Line-O-Power Drives and base plates.

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New SECO "ECONOMY" SLITTER

Slit Mill-Width Coils and Sheets in Your Own Plant with this Efficient, Low-Cost Slitter

● Designed especially for manufacturers and warehouses, this SECO "Economy" Slitter can really cut your steel costs! In most cases you can slit coils and sheets to your special widths at substantial savings over steel mill special-width prices. Delivery to you is speeded up. Large inventories of steel in special widths can be greatly reduced. And operation for only a few days a month will pay for this new SECO Slitter in a short time.

This SECO "Economy" Slitter is a rugged, high-quality machine with no frills or fancy gadgets . . . so that the price is amazingly low, and your initial investment is relatively small. It will handle either coils or sheets up to 48" wide, and is efficient, economical and simple to operate.

Write today for further information, giving your own specific requirements. We'll be glad to furnish full information and data — no obligation.

STEEL EQUIPMENT CO., P. O. BOX 737, WARRENSVILLE STATION CLEVELAND 22, OHIO

FEATURES OF THE SECO "ECONOMY" SLITTER

- Slits coils and sheets
- Handles widths to 48" . . . thicknesses to .090"
- Combination "pull-thru" or "power-driven" slitter
- Can be built for 6" to 14" diam. knives
- AC constant speed, DC motor or variable speed transmission power source
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DESIGNERS and BUILDERS of the following STEEL MILL EQUIPMENT

Leveling and Shearing Lines • Combination Edging and Flattening Lines • Tension Reels for Strip Polishers • Narrow Strip Grinding Machines • Multiple Strand Pull-Out Rolls and Take-Up Frames • Strip Coilers of the Up and Down Coiling Types • Traverse Reels for Narrow Strip • Scrap Ballers

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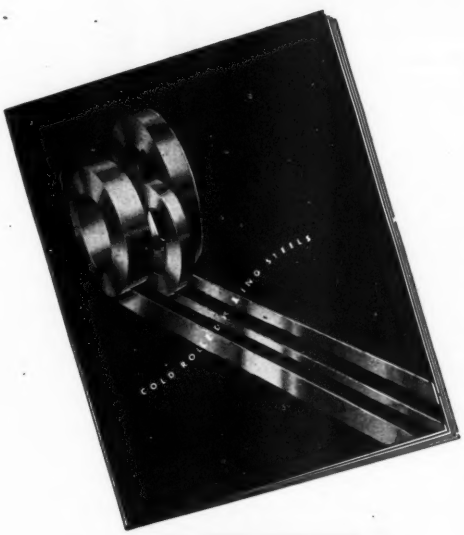
ASK THIS EXPERT...

to help you solve your spring steel problem



DO YOU HAVE YOUR COPY OF THIS FREE, NEW SANDVIK CATALOG?

Catalogues 785 sizes. Gives thickness, width, hardness, types of edges and weight in pounds per hundred feet. Also useful conversion tables. Write, on your letterhead, today.

The next time you have a problem in spring steel, call your Sandvik representative. Through experience, he has learned what the requirements of many specific spring steel applications are.

Tell him about your problem and, chances are, he can advise you as to which type of steel will best fit the job. His technical knowledge and practical experience are yours for the asking.

Furthermore, there are 785 chances that he can give you the exact type and size of steel you need, right "out of the bin." Sandvik strip steel stocks include approximately 652 cold-rolled, hardened and tempered sizes and 133 cold-rolled and bright annealed sizes.

Sandvik high quality spring steels are available:

- **In straight carbon and alloy grades**
- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- **In thicknesses from .001"**
- **In a wide range of widths**
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Phone, write or wire your nearest Sandvik office for further information or technical help.

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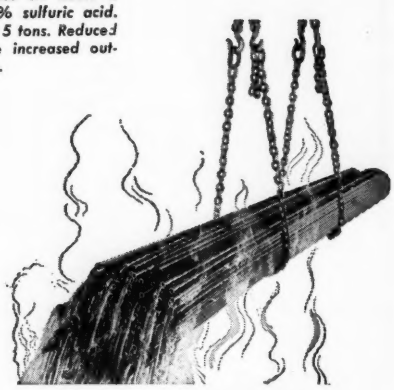
SANDVIK CANADIAN LTD., 426 McGill St., Montreal, Canada

Former chains on these mechanical picklers used to fail in 2½ months. Monel chains are giving 1½ years' service 24 hours a day in hot, 10% sulfuric acid. Average load is 5 tons. Reduced shut-downs have increased output substantially.



Monel sling chains hand'ing 4 to 5 tons of steel tubing. 75 such chains are in this plant. Where 1¼" chains of another metal failed in 9 months, these Monel chains have already served 6 years.

The Life is longer
The Weight is less
The Metal is Monel

Monel® Pickling Chain — like *any* piece of Monel pickling equipment — pays for itself.

Any pickling-room foreman or superintendent who has used Monel will tell you that.

For he knows that Monel's superior resistance to corrosion by hot pickling acids and fumes means longer life and greater safety.

He knows, too, that the higher strength of Monel makes it possible to use *lighter* chain that saves up to 20% in dead weight.

Monel link chain is formed from hot-rolled rod, and welded. The welds retain all the strength and all the corrosion resistance of the parent metal.

Regular Monel chain ranges in size from ¼" to 1¼". In addition, special types of sprocket chain, as well as a complete line of accessories such as hooks, lifting links, U-bolts and open links are available.

Whether you are using chain as slings or in mechanical picklers, you'll get the maximum in safety, long life and light weight, if you make that chain *Monel!*

Mechanical pickler chains made of Monel for use in the pickling of steel pipe prior to galvanizing. Chains are so designed to permit quick and easy replacement of any individual part.

Although deliveries of Nickel and Nickel Alloys take longer because of defense needs, we will continue to bring you news of products, applications, and technical developments.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE INCO TRADE MARK

Monel
PICKLING EQUIPMENT

extra life
extra capacity
extra safety

The Metalworking Outlook

February 11, 1952

Practical Politics

Many factors dictated the Administration's decision to postpone some of our defense production objectives a year or more: Slight lessening in international tension, desire to ease the pressure on prices, insufficient machine tools that made achievement of many goals impossible anyway. But a compelling factor was political, to make possible more civilian production to keep the voters reasonably content in this presidential election year. Just token increases will be permitted in civilian output in most cases, but the bars will be lowered a little more than a token amount for the politically important auto industry.

It May Backfire

The inflation angle in the postponement decision may backfire on the Administration. If we are lessening the danger of inflation, many congressmen will reason, then we don't need price controls. "Let's omit price control machinery when we extend the Defense Production Act which expires June 30". That issue will be the key one when debate on the extension starts. The move to throw the whole act out will make little headway. Best bet: The act, with watered-down price controls, will be extended, but only to February, 1953, when a Republican administration might be in the saddle.

Regional Rebellion

Strong opposition to extension of the Defense Production Act in its present form also will come on a regional basis. Last week's rhubarb over the Office of Defense Manpower price differential policy to ease unemployment was only the start. The South, beneficiary of new and growing industries, doesn't want the government paying more in the North for goods that might be produced cheaper in its bailiwick. One effect Southern congressmen fear would be to halt the movement of textile industries southward from New England.

No Windfall

Don't count on substantially increased copper and aluminum allotments for civilian production as result of the stretching out of the defense program. Extending the time limit for reaching the defense goals will mean only that consumer goods industries won't be hit as hard as they would have been. Prospects for more copper and aluminum are dim.

Copper Into Inventories?

Part of the present copper shortage may be the result of a building of inventories of products made from the red metal. Reels on which copper electrical transmission wire is shipped to users and warehouses are not returning to wire mills in their former volume and regularity. The copper supply stringency probably influences some users to hang

Production-Engineering News—p. 81 *The Market Outlook—p. 149*

on to reels as long as there is any wire on them. But informed people in the trade don't think this is the major reason for the slowdown. The conclusion is that no opportunity is being turned down to enhance inventories of scarce products. That's just a natural inclination, and copper probably is not exempt from it.

Insult to Injury

Plight of materials-throttled industries is being further aggravated by foreign companies making a play for their market. The competition is by no means limited to machine tools. American manufacturers of brass screws, for example, have to turn down business while a Belgian company offers the same products both in packages and bulk at prices well below the U.S. rate. Delivery can be had in 6 to 12 weeks.

Accent on Action

Fast action on loan applications is the rule laid down by Small Defense Plants Administration. Average time needed to process an application is less than a week after it is received. Loans from the $100 million small business fund will be coming thick and fast in the near future. First loan ($80,000 for working capital) went out early this month.

Fair Trade Gets the Nod

Pressure will mount in Congress for legislation to effectuate state Fair Trade Laws. The House Small Business Committee recommended that Congress allow states jurisdiction over retail trade practices and make enforcement of fair trade contracts in interstate commerce possible. The committee believes small business in particular needs protection from price cutting.

Straws in the Wind

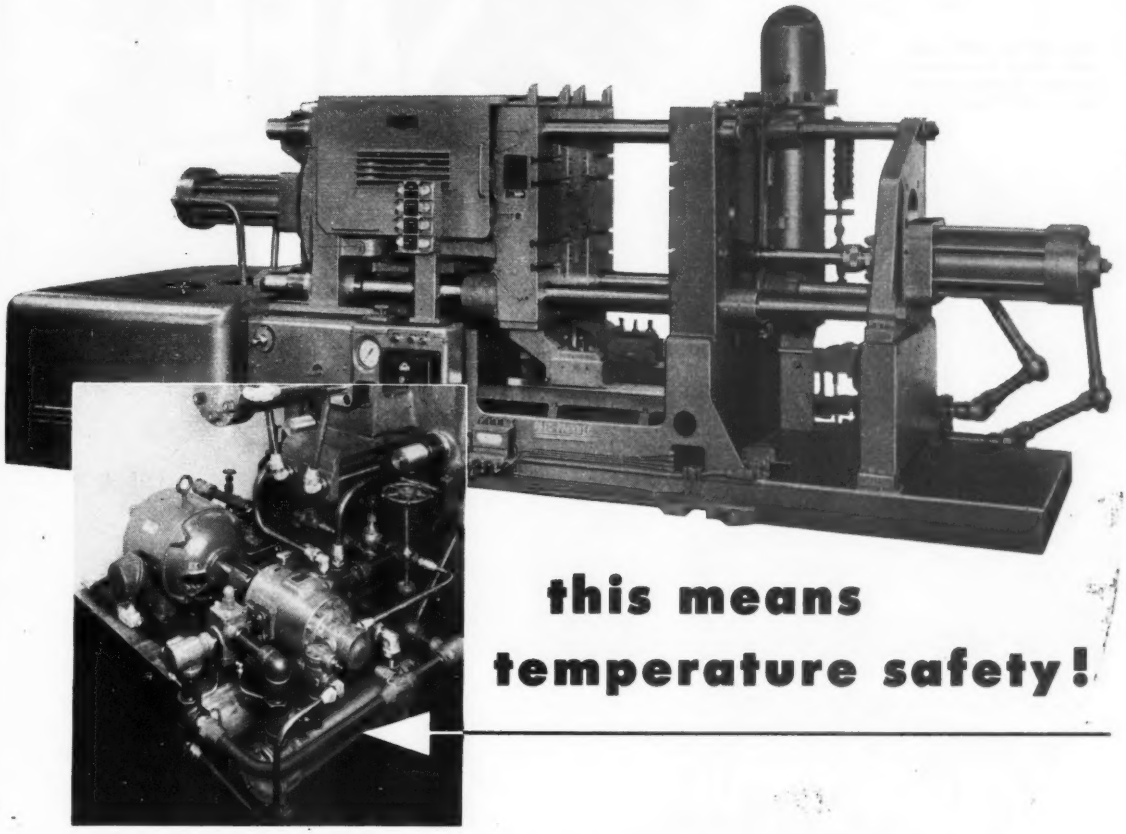
A two-year contract between GE's Carboloy Department and Local 771, UAW-CIO, provides for one month's notice on job transfers for each year's seniority up to six years and cost-of-living adjustments every six months . . . Preliminary estimates show almost 2 million additional tons of iron and steel scrap may be available from auto wreckers' yards this year . . . Push on electric power expansion promises to continue for at least three years. Westinghouse Steam division expects to ship 3 million kilowatts of turbine capacity this year and for production to continue during the next three years at 3½ times the rate of its best prewar year.

Here and There in Industry

Help is on the way for distressed areas and industries (p. 54) . . . Positions are shifting slightly in the steel wage dispute, but the odds are still against a strike (p. 55) . . . The more you sell, the more you earn is no longer completely true (p. 56) . . . Subcontractors get aid in locating scarce materials at Cadillac (p. 59) . . . More than $1 billion in contracts have been placed in tool pools (p. 64) . . . Water conditioning equipment becomes more necessary to industry as the world's water table drops (p. 65).

On Reed-Prentice Die Casters . . .

on any hydraulic machines



this means temperature safety!

Metal working industries utilizing Reed-Prentice Die Casting Machines have long profited from built-in temperature protection... because a Ross Type BCF Exchanger has been on the job to safeguard the hydraulic fluid.

For years, Reed-Prentice machines, like the Model No. 2G shown, for aluminum, magnesium and brass alloys, have incorporated the performance-proved Ross "BCF" as factory equipment. To the user, it has meant continuous production, unhampered by pump slippage and other damaging effects of excessive oil temperatures. To Reed-Prentice Corporation of Worcester, Mass., it has meant a fast and reliable answer to heat removal needs... *fast because the "BCF" is a fully standardized, pre-engineered unit available from stock . . . reliable because of its durable copper and copper alloy construction, its careful engineering.*

For data, request new Ross Bulletin 1.1K5.

ROSS HEATER & MFG. CO., INC., Division of American Radiator and Standard Sanitary Corp., 1431 West Avenue, Buffalo 13, N. Y. In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

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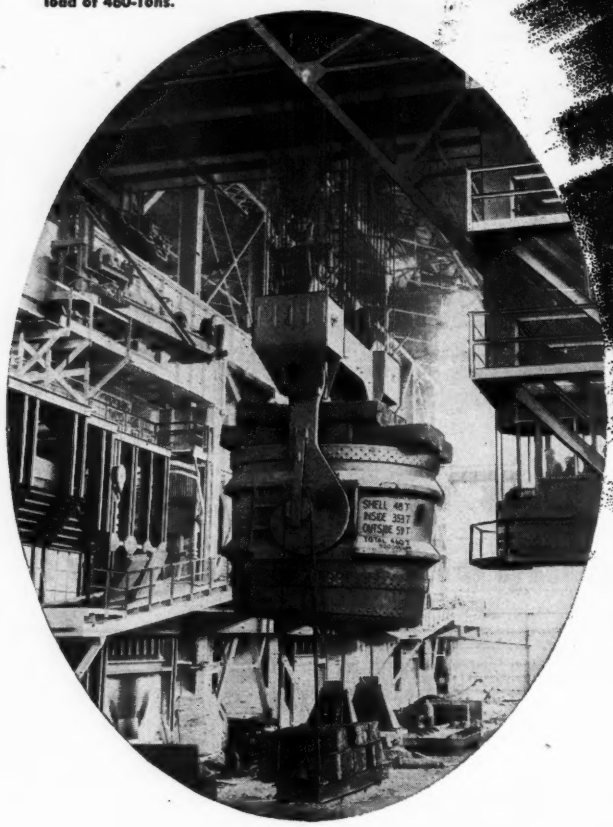
EXCHANGERS

Serving home and industry

AMERICAN-STANDARD · AMERICAN BLOWER · ACME CABINETS · CHURCH SEATS · DETROIT LUBRICATOR · KEWANEE BOILERS · ROSS HEATER · TONAWANDA IRON

SAFE Crane Control

New 300-Ton ladle crane with EC&M Control successfully handling a test load of 460-Tons.



New dynamic lowering circuits for d-c crane-hoists come and go—are superseded by other new circuits, but the well-known EC&M Wright Dynamic Lowering Circuit Hoist Controller continues to be first choice for industrial cranes.

Quick brake-release and fast-operating LINE-ARC Contactors permit accurate spotting of heavy loads—resulting in fewer inching movements, which maintenance men recognize as a contributing factor to reduced upkeep.

Also important is that the operator has direct control (from the Master Switch) of all loads in the lowering direction. The EC&M Wright Circuit is SAFE.

When Buying Cranes It Pays To Specify E&M Control

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Safeguards Against Error

In an address to Automotive and Aviation Parts Manufacturers on Jan. 30, L. L. Colbert, president of the Chrysler Corp., made a strong case for reducing government controls over manufacturing to the lowest practical minimum.

In presenting his argument Mr. Colbert displayed a sympathetic understanding of the difficulties which beset the planners in Washington who undertake to make great decisions affecting the defense program and the nation's economy. Their decisions affecting a future time, he said, cannot be separated from a considerable element of guesswork. "With all their enormous collections of information, the analysts still must arrive at an opinion every time they face a decision. . . . We have to respect these men for the courage they display in making the decisions on a scale never before attempted, in peacetime at least, with so much at stake."

Then Mr. Colbert points out that when businessmen make great decisions, they have far better protection against wrong judgment. "For where wrong guesses are made by one concern, others usually are quick to move in competitively and so offset the damaging effects on other business." He also points out that in normal times the people make decisions which shape the course of the economy. For generations "they corrected bad guesses as to price, or style, or supply, and OK'd the good ones by keeping their hands in their pockets to rule one way or pulling them out with dollar bills in them to decide the other way. These millions of decisions were reached without planning, without strain. Most of us think they were pretty good. The rest of the world envies the result."

The pertinent point is that under present circumstances, the government planners can and do frequently make bad decisions. Unfortunately there are no competitive forces within the nation strong enough to offset a serious error. Consequently all of us must suffer its consequences.

Almost every phase of the present confusion argues for a drastic narrowing of economic controls. We have seen enough of the policy of "control for control's sake" to know it is destructive. We sorely need more and better checks against bad guesses.

E. L. Shaner

EDITOR-IN-CHIEF

JETS SPUR INGENUITY: In recent years the necessity of increasing production of jet engines to an anticipated rate of 18,000 per month presented formidable problems in the forming, machining and assembling of engine parts. It is a long time since a relatively new product forced as many revolutionary changes in manufacturing methods in as short a time as has the military jet power plant.

Picked at random in the pages of this single

issue are five illustrations of these innovations. Cyril Bath Machinery Co. reports that experiments in draw forming titanium jet engine cross-section rings on its rotary forming machine are successful. The T-lathe developed by Lodge & Shipley, the right angle chucking and facing lathe of Monarch Machine Tool Co. and the automatic turbine wheel lathe built by R. K. LeBlond Machine Tool Co. have licked many difficult machining problems on jet engine parts. Taylor-Winfield Corp. has adapted a resistance seam welding machine for reducing the time required for producing jet engine cone assemblies. —pp. 86, 108, 111

* * *

TIME LAG IS FACTOR: For months structural shapes have been one of the tightest finished steel products. Plant expansion and other requirements had boosted demand far above supply. Because of the real scarcity of shapes some months ago, the official word from Washington was to ease up on new demands for structural steel. "Postpone as many projects as possible until the supply is more adequate."

In line with this advice many highway, school, hospital and bridge projects involving structural steel were abandoned or postponed indefinitely. In the meantime the output of structurals has been catching up with demand more rapidly than the planners in Washington anticipated. Because there is a considerable lag between the time architects resume work on pigeon-holed plans and the time steel is ordered, some mill authorities fear that structurals will go begging in the latter part of the year. Incidentally, this is an anxiety that is shared by some suppliers of other steel products. —p. 54

* * *

AIDS SUBCONTRACTORS: At a time when complaints about difficulties in obtaining steel are commonplace, it is refreshing to learn that somebody has devised a system for helping subcontractors to procure that important item. Cadillac's Cleveland tank plant has organized a simple system that actually is assisting subcontractors and sub-subcontractors to obtain supplies even when all other procurement devices fail.

The system is nothing more or less than a glorified newspaper "want ad" service put out in bulletin form twice a month by the Cadillac tank plant. The steel needs of subcontractors are described in a "wanted by" form designating specification and volume. The bulletins go to thousands of suppliers. More often than not, one of the recipients of the bulletin reports that he can supply the needs of subcontractor X. A sale is made and another headache is cured. —p. 59

* * *

WE PLAN, OTHERS BUILD: At the present time steelmaking in the Americas south of the Rio Grande is confined to six Latin American countries—Mexico, Colombia, Brazil, Argentina, Uruguay and Chile. The steel industries in these nations now have an annual capacity of 1,833,700 tons of ingots. Expansion in iron and steelmaking facilities is underway or planned by Brazil, Chile, Colombia and Mexico and a projected new plant in Peru will add that country's name to the list of steel producing nations. Expansion and new projects will increase Latin America's capacity to 2,543,200 tons annually sometime between 1953 and 1955.

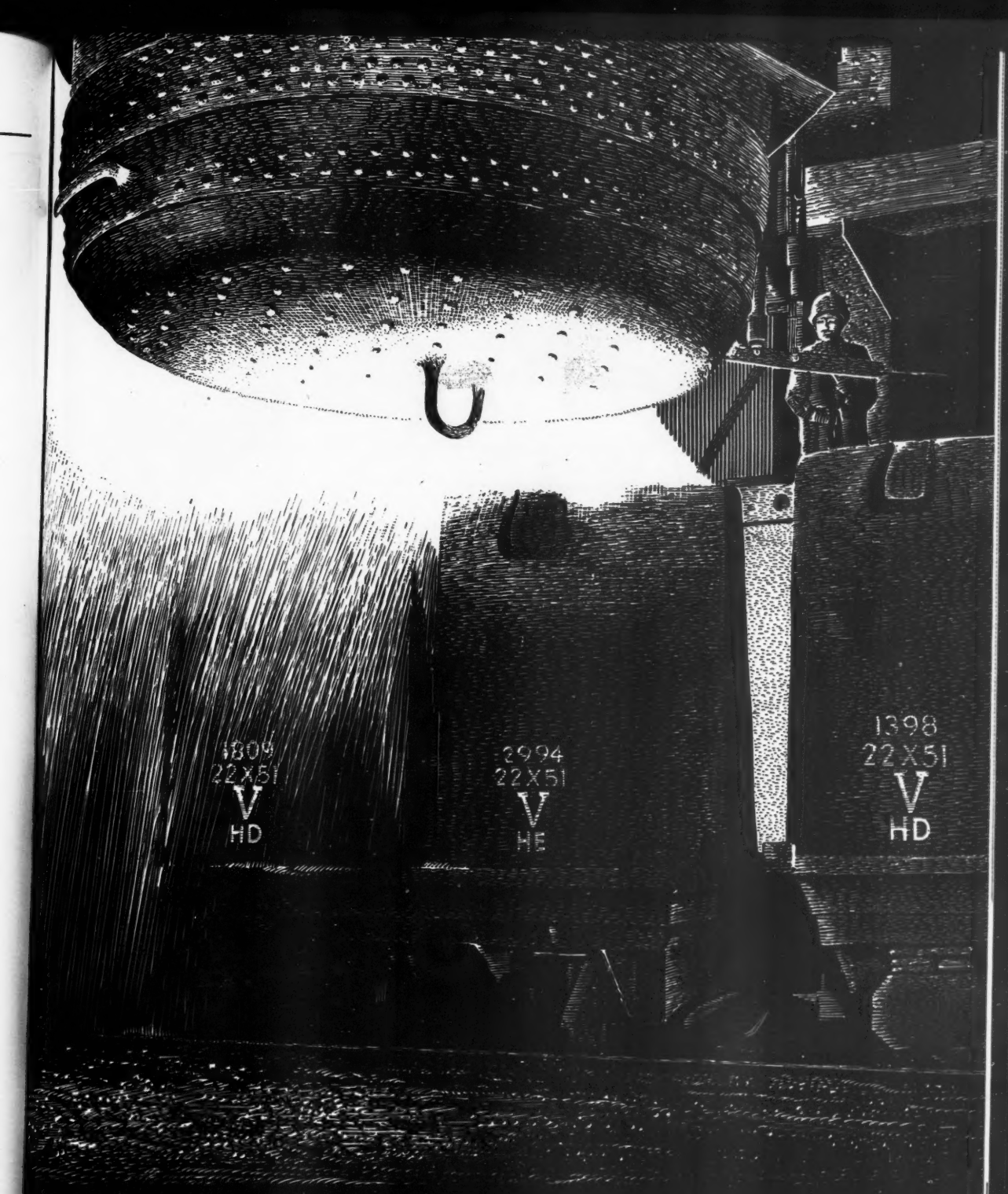
Oddly enough most of these projects are planned by United States engineering firms but the bulk of the equipment is being furnished by European builders. Reason? Our equipment companies are too busy. —p. 63

* * *

IMPORTANCE OF WATER: Two factors are contributing to a marked increase in the market for water conditioning equipment in the United States. One is the alarming dropping of the water table in many regions. Water drawn from lower levels usually is harder and has to be demineralized for certain uses. The other factor is that industries are being forced more and more to rely upon polluted waters, which must be purified before use.

Water conditioning is of course the most logical, immediate solution of both of these problems. At the same time, there are two long-range correctives which should receive more attention. One is greater interest on the part of industry in reforestation and other conservation measures which help to restore water levels to former levels. The other is continued co-operation by industry in programs to curb stream pollution.

Many metalworking executives are beginning to see that industry can benefit tremendously by co-operating in these corrective movements. —p.65



VALLEY MOULD AND IRON CORP.

General Offices: HUBBARD, OHIO

Western Office: Chicago, Ill. • Northern Office: Cleveland, O.

if paper were steel . . .

Since controls on the distribution of steel were first imposed in September of 1950, Inland, while adhering to a policy of strict observance of these regulations, has done everything possible to reduce the inevitable hardships to our customers that a controlled steel economy brings with it.

One way we have tried to be helpful: as soon as they are issued, we have carefully studied each of the regulations affecting steel users and have promptly mailed the more important ones, together with our own "boiled down" summaries, to each of our customers.

This job keeps two Inland men hopping and the data sent out to date makes an imposing array as you can see.

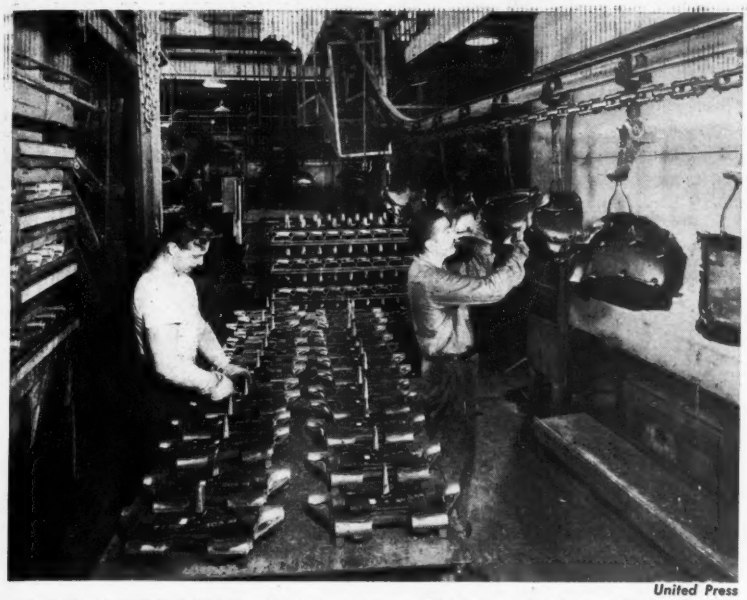
We don't like controls on steel production and distribution but, when national security demands them, we'll do our best, within their provisions, to make life as painless as possible for regular Inland steel users.

INLAND STEEL COMPANY

38 SOUTH DEARBORN STREET • CHICAGO 3, ILLINOIS

Sales Offices: **Chicago • Davenport • Detroit • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul**

Principal Products: **Sheets, Strip, Tin Mill Products, Bars, Plates, Structural Shapes, Sheet Piling, Reinforcing Bars, Pig Iron, Rails and Track Accessories.**



United Press

COMBINED OPERATIONS: Tank tracks are finished at GM Inland Mfg. Division while gravel shields for cars are checked as they pass on the conveyor. Better integration of civilian and military production programs may mean fewer controls

More Steel Decontrols Near

Rise of consumers' inventories beyond legal limits prompts NPA to assign task group to study possibility of removing restrictions on some products

WATCH for more decontrols soon on steel.

Likely to be unfettered are cold-rolled sheet and strip, secondary tin mill products, merchant pipe in small diameters, and merchant wire products.

Only two weeks ago, government controls on use of chrome stainless steel were lifted.

A group set up by National Production Authority is to study the need of decontrol of steel products which are moving into easier supply. NPA also will work with the Office of International Trade and the Mutual Security Agency to help increase export of secondary products, particularly secondary tin mill products, which are threatening to pile up at the mills because of lack of domestic demand.

Fewer Commands — Because of the general easing in pressure for steel, there's a drop in the tonnage for which directives are being issued by NPA's Iron & Steel Division. Currently, 90 per cent of the directives are for military steel. However, the total of directed tonnage is only a small fraction of the national steel output.

Helping bring government attention to additional decontrols is the growth of some steel consumers' inventories beyond legal limits.

CMP Reg. 2 limits steel inventories to a 45-day supply, or a practicable minimum working inventory, whichever is less.

Lenient—NPA is aware of the inventory accumulations but, realizing that compliance with CMP regulations has been difficult in some instances, is inclined to wink at violations of the letter of the law as long as the violations are not flagrant. NPA is loath to turn over evidence of overstocking to its compliance division unless there is evidence of willful hoarding. And the compliance division seldom initiates action on its own volition.

Back to Normal — One eastern company reveals its steel inventories average 60 days. That is what it normally carried, although there were times when the average reached 90 days. Shortest in this company's inventories, as it is in those of many other firms, is hot-rolled carbon steel bars. Its bar tonnage was less than 60 days, but it is in a comfortable position as to structurals and plates, two products that generally are in tight supply.

A Chicago metalworking company whose inventories are getting close to legal limits reveals the products nearest to exceeding the limits are light bars and structurals.

Very few outright cancellations of steel orders have been needed thus far to keep within legal inventory limits, although some buyers have requested deferment of deliveries. With the possibility that steel price increases will stem from the steelworkers' current wage demands, consumers are reluctant to cancel orders, leave CMP tickets uncashed, or dispose of excess steel inventories.

Steel Decontrols Urged

The current steel boom which has produced the biggest steel expansion in history will soon be over unless the federal government lifts its restrictions on use of steel, thinks Frank Purnell, chairman, Youngstown Sheet & Tube Co.

"If the government doesn't act," he says, "we're apt to find ourselves in the ridiculous position of having some steel facilities, built at prohibitively high costs, idle for lack of orders, while some of our customers still aren't able to get the steel they need to stay in business."

Costly Steel

Purchases of conversion and foreign steel in 1951 by Caterpillar Tractor Co., Peoria, Ill., amounted to approximately 35 per cent of the total weight of steel bought by the company that year.

Additional cost of conversion and

foreign steel was $23.5 million, but, says the company, to have operated at less than full productive capacity in order to avoid these costly premiums would have been detrimental to the long-term interests of the company.

Steel Expansion: Biggest Yet

The steel industry will spend about $1.3 billion on expansion in 1952. So says American Iron & Steel Institute on the basis of estimates turned in by the companies. If that peak is reached, the seven-year outlay, 1946-1952 inclusive, will be over $4.7 billion—an amount equal to 70 per cent of the industry's total investment at the beginning of 1951.

In 1951, the industry spent $1041 million for new equipment and construction, 103 per cent above the $513 million spent during 1950.

Signs of Relief in Structurals

Keep your plans for steel construction dusted off. Within a few months structural steel may go begging.

That's the advice by some steel producers arriving in Washington to attempt to persuade the National Production Authority to adopt some method for encouraging construction planning.

The story is this. NPA studies of demand and supply for structural steel made several months ago indicated a continuing tight situation for structurals. In the past month evidence accumulated that the structural supply would ease far faster than was indicated by the NPA studies. Meanwhile, many people dropped their building plans in the belief they could not obtain structural steel.

Now the steel producers believe structurals will go begging later this year because designs and plans for building bridges, highways and other construction are not ready.

Don't Miss the Deadline

File CMP-4B forms by Mar. 1 for third-quarter controlled materials or run the risk of delayed or reduced allotments!

That's the advice from the National Production Authority.

CMP-4B forms for the third quarter were mailed last week to users of steel, copper and aluminum.

MORALE BOOSTER: Thomas Lyman, secretary of the suggestion plan for Crucible Steel Co. of America's Spaulding works, posts the photograph and idea of a recent suggestion award winner. Winners' photos are also circularized throughout the company in a special bulletin. The firm used this method of recognition for two of the plan's five years. In that time, Crucible received 4870 useful suggestions and paid out more than $28,000 to its employees

Response to SOS

Distressed areas or industries can get preferential treatment on defense contracts

DISTRESSED areas (like Detroit) and distressed industries (like textiles) soon may get preferential treatment in the placement of defense and other government contracts.

Defense Manpower Policy No. 4 permits award of government work to such areas and in such industries at prices which may be 10 or 15 per cent above the bids offered by other areas or other industries. (For the Detroit reaction to that directive, see p. 68.)

The Reason—The action is aimed at alleviating the unemployment in those industries and localities resulting from limitations on civilian goods production, and possibly other causes, says Manpower Boss Arthur Flemming.

The order provides that, after certain conditions have been met, the Director of Defense Mobilization will instruct the Department of Defense and the General Services Administration to give preference to distressed areas in negotiating contracts, even though lower prices may be obtained elsewhere.

On Manpower—A Surplus Manpower Committee will be established immediately, including representatives of the Department of Defense, Department of Labor, GSA, Defense Production Administration, National Production Authority, Atomic Energy Commission and the Small Defense Plants Administration.

The Defense Manpower Administration will certify to the SMC the existence of manpower surpluses in certain areas or industries. SMC will investigate the suitability and availability of facilities in the area or industry certified for defense or governemnt production.

If the committee finds the facilities of the distressed area can be utilized, it will recommend to the Director of Defense Mobilization that he start the machinery to provide more government work for that area. The Surplus Manpower Committee may indicate how much work is needed and the maximum price differential that should be allowed.

United Press

CHECKMATE OR PRICE INCREASES?: In the chess-game wage dispute, Arthur J. Goldberg, counsel of United Steelworkers of America, and Philip Murray, CIO president, chuckle at one of the moves made by their opponents (left). Attempting to avoid being checkmated by wage increases Benjamin Fairless, head of U.S. Steel Co., and Mark Follansbee, president of Follansbee Steel Co., told their story at a special Wage Stabilization Board meeting. Dr. Harry Schulman (right, center), professor of the Yale University Law School, is head of the special six-man board

Positions Change Slightly in Steel Case

Easing in steel shortage and leveling out in the defense program mean each side can be a little more adamant in its positions, but odds still favor a peaceful settlement

THE EASING in the steel shortage and the leveling out in the defense program are having subtle effects on the steel wage case.

Chief result: Chances are greater for a steel strike, although the general odds are still against such an event.

Chain Reaction—Here's what's happening: Now that some of our defense production goals have been postponed a year or more, United Steelworkers of America figures it won't be thoroughly tarred as a "defense saboteur" if it does have to strike. Now that relief from the steel shortage is in sight, steel companies are not so worried about the effects of a steel strike on the supply-demand balance. Not that steel companies would welcome a strike; it's just that a walkout would be less calamitous now than a month or so ago.

So, both sides are a little more adamant in their positions, and the chances for a peaceful settlement of the issues are slightly less favorable than formerly; yet you can still bet that no strike will occur.

More Emphasis—Changing economic conditions has also led the steelworkers to give more emphasis to their demands for a guaranteed annual wage. Originally the strategy was to drop that issue when the going got rough. The matter still probably will not figure in a new contract, but Philip Murray is going to put up more than a token fight for it.

U. S. Steel Corp. President Ben Fairless last week in the New York hearings on the case before a Wage Stabilization Board panel placed great emphasis on the federal tax loss in case wages are boosted, but not prices. He put that loss at $11 billion. H. C. Stringfield, assistant to the executive vice president, accounting, U. S. Steel, testified that USA's demands pertaining to wage rates, vacations, holidays, shift differentials and Saturday and Sunday overtime would cost the steel companies nearly 56 cents an hour. The total cost per year for basic steel companies would amount to more than $753 million, not counting an equal increase that would result eventually in the costs to steel firms in goods and services, increases that would occur indirectly because of a steel wage grant.

Drawn-Out — The WSB panel should finish hearings this week. It will present its findings to WSB, which isn't expected to reach any conclusions by Feb. 24, when USA's truce expires. The steelworkers are expected to extend that truce, and a final WSB decision is expected late this month or early next.

The hassle will finally end up with approximately this arrangement: About 15 cents an hour for the steelworkers and a partially offsetting steel price increase of about $7.50 a ton.

Pigeon Hole for Wage Raises

Signs of distress are increasing over the Wage Stabilization Board's backlog of undecided cases. The pile-up currently amounts to more than 17,000 cases and no early relief is in sight.

CIO members of the board say they are going to take the problem to CIO President Philip Murray and other top union policy makers to try to find a way to speed up the board's case handling.

Industry members report they are getting more and more letters from businessmen complaining that the stabilizers are preventing them from putting into effect wage boosts they have agreed to and want to start paying.

Pay Checks Pile Higher

Wage and salary payments by Republic Steel Corp. reached a new high during 1951 as approximately

69,500 persons earned a total of $289,650,689.

This tops earnings of the previous record year, 1950, by $1.5 million.

Employment by Republic increased during 1951 by about 2500 persons over 1950.

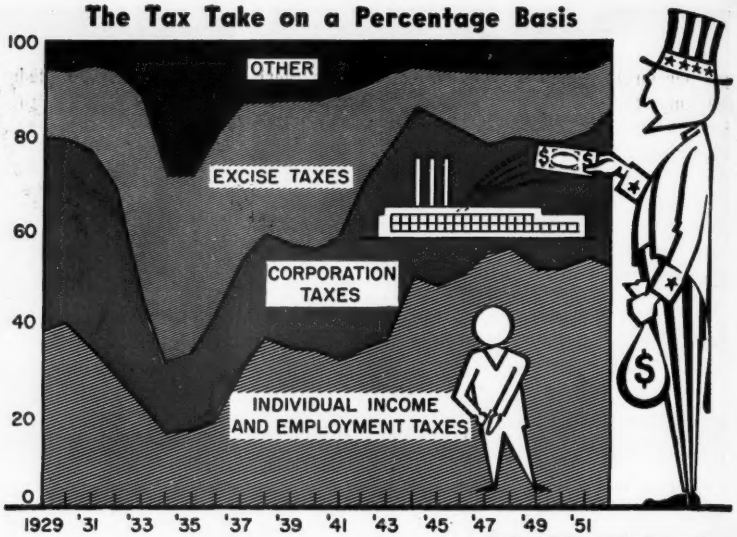
In addition to direct wage and salary payments, Republic employees received more than $26.7 million in indirect benefits such as unemployment insurance and pensions, group insurance and Social Security.

Malleable Production Expands

Malleable iron castings producers spent nearly $10 million in 1951 for mechanization and modernization, says Lowell D. Ryan, managing director, Malleable Founders' Society.

Nearly all of the money bought new equipment while a smaller part paid for new buildings. Present capacity of the industry, says Mr. Ryan, is about 1 million tons a year.

The Tax Take on a Percentage Basis



National Industrial Conference Board

More Sales—More Profits? Not Necessarily So

IT USED to be the more you sold the more you earned.

Metalworking companies' sales and earnings reports for 1951 show this is no longer entirely true. Many companies find they made and sold more things in 1951 compared with 1950 only to have less profit at the end of the year (see accompanying table).

Two main reasons for the loss of net earnings are: Increases in labor and materials costs and bigger bites taken by federal income and excess profits taxes.

Deciding Factors—One company says in its annual report to stockholders: "Any improvements in the profit picture will depend on extent to which high cost premium steel purchases can be eliminated, whether manufacturing operations can continue without interruption, and the effect of government controls on wage rates and prices."

Another says: "It is the opinion of your management that the present level of federal income and excess profits taxes, and the acceleration of payments of such taxes, endanger the financial soundness of American business."

Plowing It Back — Figuring prominently in the 1951 financial picture were increased capital investments: They held down the profits figures. Greater capital expenditures were made this year because the government encouraged expansions in many cases, and dwindling per-unit profits, particularly on defense contracts, dictated expansion of facilities for greater production.

While there is dismay over the

Earnings Have Hard Time Keeping Up With Sales

Firm Name	Sales 1951	Sales 1950	Net Earnings 1951	Net Earnings 1950
		(Thousands of Dollars)		
FISCAL YEAR ENDED DEC. 31:				
Affiliated Gas Equipment Inc. Cleveland	$41,321	$43,606	$1,808	$2,241
Caterpillar Tractor Co. Peoria, Ill.	393,756	337,285	15,732	29,264
National Tool Co. Cleveland	6,100*	3,127	248	169
Vogt Mfg. Co. Rochester, N. Y.	2,045	1,825	393	555
Emsco Derrick & Equipment Co. Los Angeles	20,307	14,148	1,097	992
FISCAL YEAR ENDED NOV. 30:				
American Pipe & Construction Co. Los Angeles	15,609	14,891	809	1,110
Builders Iron Foundry Providence, R. I.	7,955	6,172	243	218
Curtis Mfg. Co. St. Louis	1,815	1,273	546	338
Lake Shore Engineering Co. Iron Mountain, Mich.	7,677	4,036	273	122
FISCAL YEAR ENDED OCT. 31:				
Champion Motors Co. New Brighton, Minn.	1,942	1,615	96	14
Foote Brothers Gear & Machine Corp. Chicago	17,458	9,258	801	601
Gar Wood Industries Inc. Wayne, Mich.	$39,182	$20,948	$3,024	$2,098**
Globe American Corp. Kokomo, Ind.	8,394	7,595	337	518
International Harvester Co. Chicago	1,277,320	942,602	63,001	66,715
Oliver Corp. Chicago	120,113	99,279	6,006	6,241
Servel, Inc. Evansville, Ind.	45,089	57,334	989**	2,732
FISCAL YEAR ENDED SEPT. 30:				
North American Aviation Inc. Los Angeles	179,443	143,268	6,422	8,086

*Preliminary **Loss

bite federal taxes take out of corporate income, individual and employment taxes account for a bigger percentage of total federal tax revenues (see chart on p. 56). Individual income taxes plus employment taxes now account for 52 per cent of the total, compared to 37 per cent in 1929. Corporations furnish 34 per cent, against 42 per cent in 1929, says the National Industrial Conference Board.

Making Ends Meet

Relative essentiality is forcing the soft goods machinery industry further into defense

MAKERS of special machinery used in soft goods fields are making ends meet these days—though just barely in some cases.

They're doing it on partial production of new machines, a great deal of repair and replacement parts manufacture, and a growing volume of defense work.

What's Needed?—Relative essentiality precludes full civilian production in the soft goods machinery industries, though they don't all bear the "unnecessary" label. Manufacturers of machinery for the pulp and paper industry point to the current half-billion dollar expansion program in that field, largely made up of projects for which certificates of necessity have been granted. Metals allowances to this industry can't sustain full operations and manufacturers must devote from 10 to 50 per cent of total production to other rated work.

Another big reason for the special machinery group to schedule arms orders: In many cases, postwar demand peak was passed before Korea and the 1951 nondurable goods slump scared many a producer from expanding his plant or investing in new machinery.

Textile machinery is the most obvious example. Orders are at lowest ebb in the postwar period and machinery producers doubt that production would be increased much if controls were off. The textile industry is no longer No. 1 employer in New England, now that metalworking and electrical machinery companies are booming.

The shoe machinery industry is in much the same position as textiles, though the retail slump hasn't been quite so severe. Woodworking machinery is another field of lagging activity; companies in this field have "substantial" inventories and a dearth of orders. A packaging machinery maker reports civilian production off about 75 per cent; materials cutbacks aren't the compelling force here either.

The Deterrents—For machinery makers, the threat of shortages winds around copper and its alloys, aluminum and stainless steel. Substitutions are limited. In food processing machinery, for example, straight chrome stainless can be used for dry filling equipment but not in wet lines. This industry claims a "fair-sized" backlog well under its year-ago level but cautions that the lush selling days are over.

Among process equipment producers, those making chemical and rubber process machinery are better off than the foods group. That's because chemicals are in defense demand and rise in synthetic rubber output necessitates a variety of process equipment.

Inside Track—In most favorable position to land substantial defense contracts are those companies with complicated fabricating equipment for precision work. Thus producers of printing presses and graphic arts equipment have been able to take on such jobs as machine tool subcontracting—often for complete units. In that industry, defense takes close to 40 per cent of total production (it averaged about 10 per cent last year). Approximately 25 per cent of current production is machine tool work; the remaining 15 per cent goes into such items as gun carriages, munitions (shells, rockets, warheads, components) and other electronic, chemical and atomic energy defense equipment.

In normal times, the graphic arts equipment industry might operate at about the 1949-50 rate, which was off a bit from its fabulous '48, but still good. Most producers think intensive selling pressure would be required to sustain even that rate.

NEA

WRINKLE IN PAPER MACHINERY
. . . its essentiality is relative

Parker Sales Up

More than half the output of Parker Appliance Co., Cleveland, O. and its subsidiaries went to airframe, engine and aircraft accessory manufacturers in the last six months of 1951. Sales, says the company, more than doubled those of the corresponding period in 1950 by reaching $10.5 million. In a two-year $5.5 million expansion program, the company has added new plant and equipment at Parker Aircraft Co., Los Angeles, where it plans to manufacture products recently developed in the aircraft field.

L. A. Expands Aircraft Plants

Aircraft and aircraft parts plants added new production facilities valued at $216.9 million in the Los Angeles area. The new facilities included 14 new plants and increased capacity of 103 existing factories. Last year's increase in production facilities is estimated at 1174 per cent of the 1950 figure.

Luscombe Delivers B-36 Rudders

Luscombe Airplane Corp., Garland, Tex., has begun delivery of rudders under a contract recently obtained from Consolidated Vultee Aircraft Corp., builders of the B-36 bomber.

For production of the rudders it was necessary to move more than 110 tons of assembly jigs and other tooling items from Convair's Ft. Worth plant to Garland. Luscombe also turns out B-36 elevators, doors and hatches.

REACTIVATION: The Air Force expansion program had made it necessary to reactivate the white 35-acre Heppenstall Co. buildings at Eddystone, Pa., to make die blocks. Heppenstall built the Delaware river plant during World War II for the Navy, but it is now under the jurisdiction of the Air Force. In the background is a portion of the Baldwin-Lima-Hamilton Corp. The structures in left foreground are service buildings of the Sun Shipbuilding Corp.

Hardship Allotments Slated for Small Firms

SMALL manufacturers facing shutdown because of low allotments and inability to get defense work may obtain aid from the Small Business Hardship Account.

Designed for firms not flexible enough to cope with shortages, the Hardship Account was set up by the National Production Authority and the Small Defense Plants Administration.

Hardship aid will be supplementary to the quarterly allocations of controlled materials each firm receives. The aid will be effective with second-quarter allotments.

Manna—To reduce allotment requests, the NPA is raising also the quantities a manufacturer may self-certify on purchase orders for the second quarter. Under this arrangement, a vast number of small manufacturers are allowed to obtain 100 per cent of their base period consumption if the amounts are not more than 30 tons of carbon steel, eight tons of alloy, 500 pounds of nickel-bearing stainless, 3000 pounds of copper and copper-base alloy, and 2000 pounds of aluminum.

Companies which require larger amounts than permitted for self-certification must apply for them under CMP-4B. Many thousands of these firms, says the NPA, will get only 50 per cent of base period steel and 30 per cent of base period aluminum because they have little or no defense work.

Earmarked—The Hardship Account is earmarked for small firms which are single-line producers—manufacturers having more than 50 per cent of value in products classified as civilian-type. The firm must be faced with failure or prolonged shutdown because of insufficient allotments of controlled materials. Also the plant facilities must be unsuitable for conversion.

Requests for allotments from the Hardship Account will be reviewed by a Small Business Hardship Account Panel set up by NPA.

If lack of sufficient defense subcontracts is your problem, check over the accompanying table. It's a selection from the latest contracts valued at more than $250,000 each awarded by the government.

PRODUCT	CONTRACTOR
Shell HE 155 MM	Minneapolis-Moline Power Equipment Co., Minneapolis
Shell HE 60 MM	Lehigh Foundries Inc., Easton, Pa.
Automatic Guns	Buffalo Arms Inc., Buffalo
Gun Carriages	Dravo Corp., Pittsburgh
	Treadwell Construction Co., Midland, Pa.
Cartridge Cases	Ackermann Mfg. Co., Wheeling, W. Va.
Range Finders	General Motors Corp., Detroit
Gas Cylinders	Harrisburg Steel Corp., Harrisburg, Pa.
	Taylor-Wharton Iron & Steel Co., High Bridge, N. Y.
Air Conditioning Units	Refrigeration Engineering Corp., Reco Products Div., Philadelphia
Air Compressors	Ingersoll-Rand Co., New York
Centrifugal Pumps	Food Machinery & Chemical Corp., Hoopeston, N. Y.
Generator Sets	Kohler Co., Kohler, Wis.
Radio Sets	Admiral Corp., Chicago
Transmitters	General Electric Co., Schenectady, N. Y.
Radiographic Units	Picker X-Ray, White Plains, N. Y.
Alternators	Westinghouse Electric Corp., Pittsburgh
Teletypewriter Sets	Maspeth Telephone & Radio Co., Brooklyn, N. Y.
Turret Lathes	Warner & Swasey Co., Cleveland
Surface Grinders	Thompson Grinder Co., Springfield, O.
Metal Sawing Machines	Do-All Cincinnati Co., Cincinnati
Automotive Parts	General Motors Corp., Detroit
Automobile Tools	National Farm Machinery Co-op Inc., Shelbyville, Ind.
Tools	Cooper & Cooper Inc., Chicago
Tool Equipment	W. C. Fleck Bros., Jenkintown, Pa.
Machinery	Wagner Electric Corp., Pittsburgh
Forgings	Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Ford To Build New Jet Plant

Jet engines for the Navy will be produced by Ford Motor Co. at a new $50 million plant at Romulus, Mich. The Navy says the Lincoln-Mercury Division of the company will construct and operate the plant, but it will be Navy-owned. The Romulus plant, scheduled to be finished in the spring of next year, will be used for final assembly and engine tests.

Fabrication and subassembly of the J-40 engine parts will be done at the Lincoln-Mercury Division's plant at Wayne, Mich. The Wayne plant will operate under the Navy's dual-economy plan designed to allow partial civilian production, but adaptable to fast conversion to military output. The Wayne plant is slated to begin its civilian production this summer.

Together, the Wayne and Romulus plants will employ about 2400 people for jet engine production, says Ford. An additional 3000 workers will be needed at Wayne for automobile assembly.

Ford's aircraft engine division says it is laying off some hourly and salaried workers, because initial rehabilitation work on reciprocating engines is completed and only exploratory work has begun on new jet contracts. Less than 5 per cent of the total work force will be laid off, says the company.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

SCRAP—Amendment of Jan. 30, 1952, of NPA Order M-20 brings provisions of this order into line with M-92, the order which governs auto wreckers' scrap.

MINING—Amendment of Jan. 30, 1952, of NPA Order M-78 makes this order on maintenance, repairs and operating supplies applicable to the segment of the mining industry under the Defense Materials Procurement Agency, instead of the Defense Minerals Administration. The latter organization no longer exists.

STEEL—Amendment of Feb. 1, 1952, of NPA Order M-1 incorporates provisions made necessary by operation under the production directive system and a closed-end GMP. Steel production is now regulated entirely by directives or by production schedules authorized in connection with approved CMP 4-B applications. The amendment was effective Feb. 1. Directions 1, 2 and 4 to M-1 were revoked because they are obsolete, and Direction 3 was revoked since it is incorporated in the body of the amended order.

LIGHTING FIXTURES—NPA Order M-97, issued Feb. 4, 1952, limits the use of copper in the manufacture of electric lighting fixtures to specific functional parts. The order is effective Feb. 15, 1952.

NPA Delegations

MINERALS—Amendments of Jan. 29 of NPA Delegation 5, NPA Delegation 14 and Defense Production Administration Order 1 spell out in detail the areas in which the Defense Materials Procurement Agency will serve as claimant and disburser of materials for mines, concentrators, smelters and refineries. The amendments, effective Jan. 30, do not substantially change recent practices.

Price Regulation

SCRAP—Amendment 7 of Ceiling Price Regulation 5 eliminates from the regulation premium Grade 30 hard steel cut 2 feet and under and eases the restriction on premiums established for Grades 11 through 18 and for Grades 20 and 21. Amendment 7 was effective Feb. 5, 1952.

Cadillac System Ferrets Out Materials for Subcontractors

ASSISTANCE to subcontractors in getting the steel they need is given by Cadillac Cleveland Tank Plant through a unique direct-by-mail system.

Like a subcontractor's bird dog, the system flushes out odd-item, often small quantity, lots of scarce steel and nonferrous materials, then points the supplier in the right direction.

One second tier Cadillac supplier (a sub-subcontractor) in Kalamazoo, Mich., didn't know of the procurement aid system and went to Washington for help in locating his steel requirements—two 2¼" steel plates. The sub travelled 2400 miles up and down the East Coast unsuccessfully before an Army Ordnance official in Washington directed him back to Ohio and the Cadillac plant, where, in a matter of hours, Cadillac helped him find a source of supply.

Broadcast—It works like this: Subcontractors A, B, and C advise Cadillac what materials they need to fill a components contract and have been unable to find for themselves. Earl F. Smith, in Cadillac's purchasing department, puts this detailed information into a printed "wanted by" form which is sent to a selected list of 900 warehouses across the country. Warehouse X contacts Cadillac saying they have all the materials sub A wants—a telegram goes out from Cadillac to the sub A telling him warehouse X has what he's looking for. Warehouse Y calls Cadillac to say they have part of what B wants—a phone call or telegram goes to B giving the partial source. Then, if sub B requests it, his name goes back on the "wanted by" list next time. The lists are now going out bi-monthly.

Warehouse Z, seeing sub C's name and address on the materials "wanted by" form, contacts C directly. In no case does Cadillac do the buying for the sub.

Keyed to Specs — The forms, which make the system go, give and get exact information. On one form, warehouses are screened as to what types and shapes each handles. Address cards of the warehouses are keyed to these specifications. The subcontractor in requesting help must be specific as to amount, size, chemistry and possible substitutes for the materials he needs. "Wanted by" forms give all this information plus the location and contact man of the sub.

Trend line of the number of suppliers asking for help has many hills and vales: Hills are caused by groups of new contracts being awarded; vales occur when suppliers get procurement aid or their warehouse orders begin coming through.

Big Ones, Small Ones — In 1951 the number of subcontractors and suppliers for Cadillac Cleveland Tank Plant constantly increased: 1300 in March, 1951, 1983 in October and 2951 in December, 1951. Of the present suppliers, 2095 are small business (under 500 persons employed) and two typical subcontractors revealed that they in turn have 85 big business suppliers and 275 small business ones.

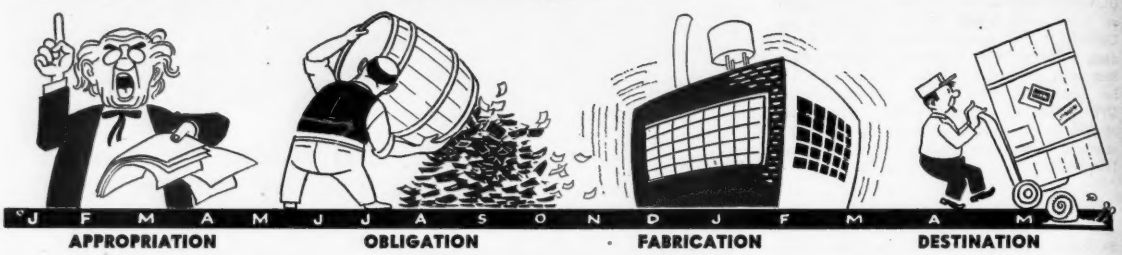
By using mailed forms extensively, Cadillac is able to put their procurement-aid system for subcontractors on a country-wide basis. More than half the cases appearing on "wanted by" lists are known by Cadillac to be pointed toward a source of supply which the supplier himself is unable to find. How many more suppliers get direct calls from warehouses as a result of the system isn't known.

The important thing, says F. S. Philo, manager of purchases for the Cadillac tank plant, is "the system helps the supplier help us get the job done and on time."

United Press

QUICK LOOK: When the Senate Appropriations and Economics Committees saw the $250,000 K-1 radar-electronic bombing system, Air Force Secretary Thomas K. Finletter (left) and Defense Secretary Robert A. Lovett compared it with the $8000 Norden model. Wraps were put back on the K-1 before photographers arrived

Windows of Washington



TWO OUT OF THREE dollars spent for defense go for hard goods and construction.

Time lapse between purchase authorization and delivery of the hard goods is lengthy. That's because of the complicated weapons required for modern warfare.

Pyramid's Base — From July, 1950, when fighting began in Korea, to the beginning of 1952, defense obligations totaled $76 billion. Hard goods (aircraft, ships, weapons, ammunition, electronics, production equipment) accounted for $45.3 billion and construction for $2.7 billion. Soft goods took less than $6 billion and the remaining $22 billion went for pay and other services.

Hard goods procurement currently is taking about $2 billion a month. For the last six months of 1951, procurement of hard goods totaled a little less than $11 billion.

What's Ahead—If the defense budget before Congress now is approved, defense procurement over the next 18 months will total $100 billion, or 30 per cent more than was obligated over the last 18 months.

To the metalworking industry, these figures do not present a wholly accurate picture. The figures are obligations only. Much of the defense money obligated in the last 18 or 20 months represents production yet to come. The full impact of defense spending over coming months will be substantially heavier than in the past.

Defense Comes High—The three-year bill for defense and aid to Europe, from Korea to June, 1953, will total $176.6 billion, or $1132 for each man, woman and child in the United States.

Department of Defense obligations account for $161.2 billion and the Mutual Security Agency program will take $15.4 billion.

NPA Asks More Boron Steels . . .

Look for a steady increase in boron steel production. National Production Authority is pressuring steel producers to step up output of boron-treated steels to relieve a continuing acute shortage of nickel, tungsten, cobalt and molybdenum. The scarcity of alloying elements, says NPA, will necessitate "downgrading" of alloy steels for many uses, including the aircraft program.

Tonnagewise, boron steel production is not impressive. Scheduled output in February will be about 50,000 tons. Percentagewise, this represents a 100 per cent increase over output last August.

Plastic Pipe for Navy . . .

The Navy wants it to be known that it will do its share toward conserving scarce metals. Several minesweepers now being built will use plastic piping, saving about 4000 pounds of copper and nickel.

After an 8-month sea test aboard a destroyer escort, the Navy Bureau of Ships finds plastic does not corrode from salt water, is adequately resistant to shock, and otherwise satisfactory. Two-inch plastic pipe of ⅛-inch wall thickness costs 70 cents a foot, compared with $1.55 for copper-nickel pipe and about $2.25 a foot for stainless steel pipe, according to Navy figures.

For Members Only . . .

Requirements for membership on industry advisory committees are being tightened to insure that none but active members of the industry participate. New membership specifications: "Only those persons presently and directly engaged in a business or industrial enterprise in a supervisory, managerial, scientific or technical capacity relating to the production, distribution or use of a material or service shall be eligible for membership on an industry advisory commitee. . . ."

The revision is aimed particularly at trade association executives. Theoretically, association men have have not been eligible for IAC activity. Practically, some have participated.

Excluding trade association executives for the IACs is a sore issue, dating back to World War II. Association men, and many industry people, contend that industry executives lack the time required to come to Washington for committee meetings and that they are not always as well informed on industry-wide conditions as are the trade association men.

Renegotiation Cases Assigned . . .

First job of the newly-opened regional offices of the Renegotiation Board (at Chicago, New York, Washington and Los Angeles): To dispose of some 1900 cases pending under the 1948 Renegotiation Act.

All steel, oil, bearing, shipping and major rubber company cases were assigned to the Washington regional office, John T. Koehler, Renegotiation Board chairman, says this assignment was made to equalize distribution of the cases to relieve the workload that would otherwise fall on the New York office. Mr. Koehler stressed that this assignment applies only to the 1948 Act and does not indicate a pattern to be followed with those cases coming under the 1951 Act.

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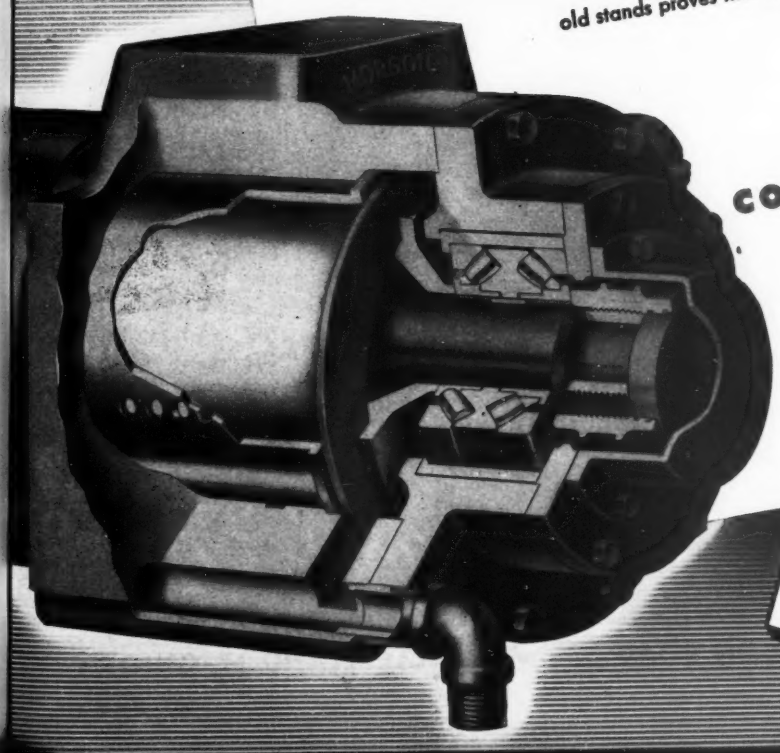
ROLL NECK BEARINGS

...the bearings that teamwork built

Morgoils are not the brainchildren of one man or any one group of men. They developed as the result of years of teamwork between our own rolling mill specialists and numerous experts from among our customers.

The one reason for such interested cooperation by our customers was their need of a better roll neck bearing. The fact that so many Morgoils are going into both new and old stands proves that Morgoils are a good investment.



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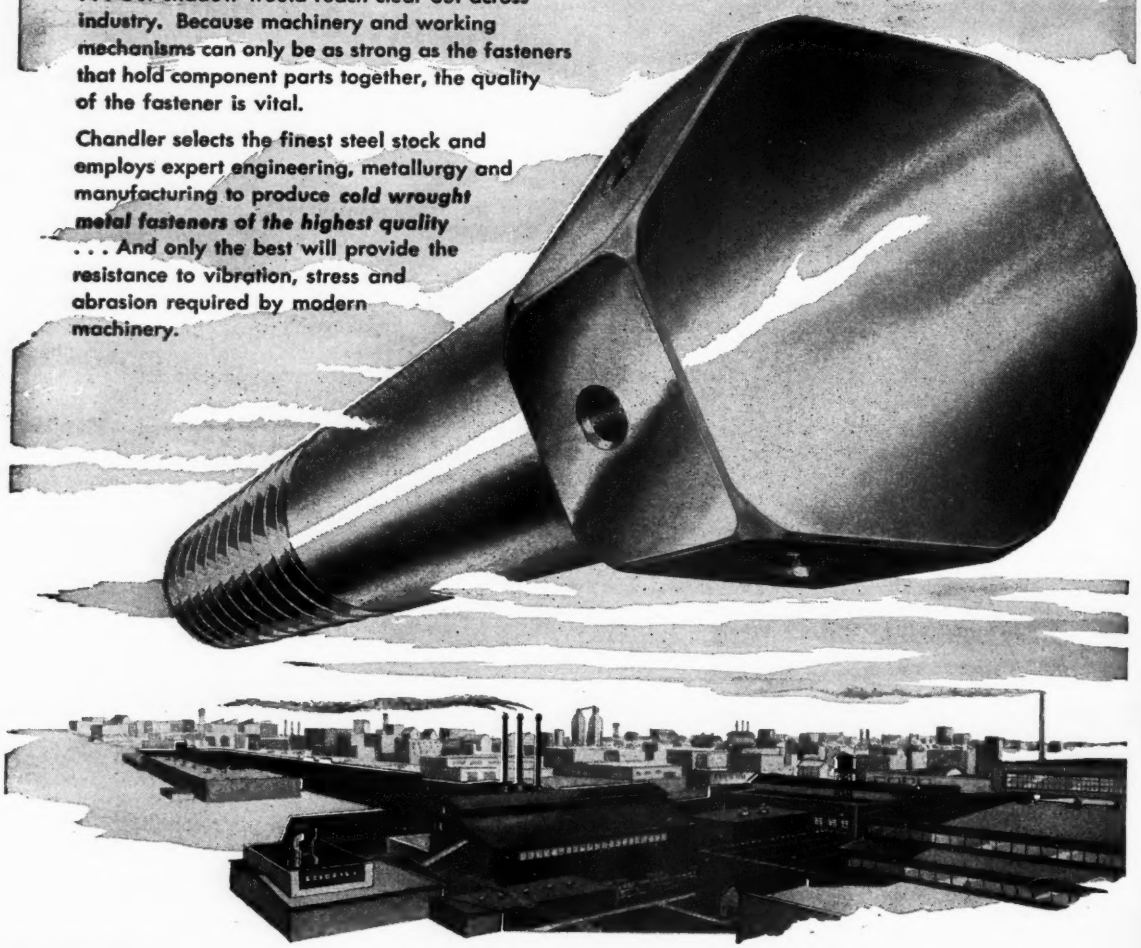
IF *Quality* COULD CAST A SHADOW . . .

. . . Our shadow would reach clear out across industry. Because machinery and working mechanisms can only be as strong as the fasteners that hold component parts together, the quality of the fastener is vital.

Chandler selects the finest steel stock and employs expert engineering, metallurgy and manufacturing to produce ***cold wrought metal fasteners of the highest quality*** . . . And only the best will provide the resistance to vibration, stress and abrasion required by modern machinery.



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Steelmaking Grows in South America

Prompted by difficulties in getting shipments from foreign sources and rising world prices, Latin Americans plan to become self-sufficient in iron and steel

SELF-SUFFICIENCY is the key word behind iron and steel industry expansion programs underway in South American countries.

Spurred by greater industrialization at home, Latin Americans are irked with difficulties in filling their iron and steel requirements abroad. Also, rising world prices have gone high enough to justify investment in these primary industries. Most important, Latin American countries have become touchy over having to rely on foreign iron and steel producers and want to become self-contained.

Goal for Steel—To existing capacity of 1,833,700 tons of steel ingots annually, they are adding 709,000 tons. Allowing for present day delays in getting steelworks equipment from foreign builders, they should have ingot capacity—sometime between 1953 and 1955—of 2,543,200 tons annually.

Figures for present capacity do not necessarily correspond to actual production. Because of lack of such supplies as coke, pig iron, and scrap, it has not been possible in the war and postwar years to operate the properties to capacity.

The expansion is spread over five countries and will add one new name to the list of Latin American republics with iron and steel industries—Peru. Other iron and steel producers to the south are Mexico, Brazil, Argentina, Colombia, Uruguay and Chile. Expansion is underway or planned by Brazil, Chile, Colombia and Mexico.

Peru—The iron and steel plant projected by Peru will be located near Chimbote adjacent to a huge hydroelectric development which will be relied on to operate electric furnaces both for reduction of ore to pig iron and conversion of pig iron to steel.

There will be two pig iron and two steel furnaces, each with capacity of 100 tons of metal per day. They will be built under patents of Pittsbugh Lectromelt Furnace Corp., by Elektrokemisk Co., of Norway, with engineering by Ranseyer & Miller Inc. Finished products will be merchant bars, concrete reinforcing bars, structural shapes to 2½-inch dimensions, wire rods and wire.

Mill equipment, designed by United Engineering & Foundry Co., will be built by Delattre et Frouard Reunis, of France. The whole project is being handled by the French firm of Stein et Roubaix.

A U. S. corporation has completed negotiations with the Peruvian Government's Santa Corp., whereby the U.S. firm guarantees, in exchange for permission to exploit the Marcona Iron deposit, near Nazca along the southern coast of Peru, to produce a minimum of 500,000 tons annually of high-grade iron ore for shipment abroad, plus 150,000 to 300,000 tons annually to be delivered locally to the Santa Corp. for shipment to Chimbote.

Brazil—In Brazil the biggest expansion program is that of the National Steel Works of Brazil. Its plant is to be enlarged by adding a new blast furnace, two new open-hearth furnaces, 21 coke ovens and new sheet mills. Its ingot capacity will go up from 330,000 to 513,700 tons annually.

There are two other important expansions in the Brazilian program. The Mogi das Cruzes company in northeast Sao Paulo is to install several electric furnaces, enlarge its two blast furnaces so they will have capacity of 150 tons of pig iron a day each, and enlarge three open-hearth furnaces so the company will have a total of four 50-ton open hearths. Mogi das Cruzes has contracted with an English builder for a mill that can produce 45,000 tons of ⅛ to 4½-inch seamless steel tubing annually, and a tube galvanizing plant. It also is to add a wire drawing plant.

In the formative stage in the state of Minas Gerais is a new company known as MANEX; a combine with the Mannessmann interests of Germany. This company is to build a plant with annual capacity for producing 110,000 tons of pipe and tubing.

Colombia — Colombia's present industry is comprised of a small rolling mill at Medellin which produces, from scrap, about 5000 tons of concrete reinforcing bars annually. But a new plant now under construction, that of Empresa Siderurgica Nacional de Paz de Rio S. A., at Belencito in the state of Boyaca, will have annual capacity of 125,000 metric tons of ingots;

LATIN AMERICAN iron and steel capacity Jan. 1, 1952 (Accurate figures are not obtainable in all cases; these set forth in this table—obtained from Commerce Department field reports and other sources—are to be regarded as fairly approximate.)

Country	Pig Iron	Steel Ingots
Brazil	638,000	715,000
Mexico	330,000	605,000
Chile	259,600	220,000
Argentina	22,000	275,000
Uruguay		13,200
Colombia		5,500
Total existing capacity	1,249,600	1,833,700
Additional Capacity, Under Construction or Definitely Planned		
Brazil		242,000
Colombia		137,500
Peru		132,000
Chile		110,000
Mexico		88,000
Total additional capacity in progress		709,500
Total capacity, as of Jan. 1, 1954		2,543,200

FROM SNOW TO POWER: Snow from the Chilean Andes is supplying power for hydro-electric plants like this one at Sauzal. Six plants with a potential of 378,000 kilowatts will reduce Chile's oil imports for power generation and free more dollars for purchase of U. S. machinery, equipment

finished products will be reinforcing bars, merchant bars, rails, light structural shapes, wire rod and plain and galvanized wire. The plant was designed by Arthur G. McKee & Co. and is being fitted out with equipment imported from France and Germany.

Argentina — Argentina now is promoting a new steelworks to be located at San Nicolas near Rosario. Planned by Armco Steel Corp., it is to have ingot capacity of 748,000 net tons annually. It is to consist of a blast furnace, six open-hearth furnaces, coke ovens, a blooming mill and rolling equipment to produce shapes, plates, bars, sheets and tin plate. Contract for the initial unit and electric generating plant has been placed with a German firm.

Chile—The Chilean producer has a substantial expansion program in an advanced stage. This includes a third open-hearth furnace, new coke ovens, a second bessemer converter, an electric furnace and some additional rolling mills.

Uruguay—In Uruguay the plant of the bankrupt M. D. F. company at Montevideo is to be put back to work. A company known as NERVION has taken over an open-hearth furnace and a rolling mill and is preparing to produce about 13,200 tons of concrete reinforcing bars annually. Another company, INLASA, now in the promotion stage, plans to take over other open-hearth furnace and the sheet mill, wire drawing department and a galvanizing shop. The two companies together are expected to supply virtually all the iron and steel Uruguay needs.

Venezuela—Venezuela plans an integrated iron and steel plant based on a Swedish sponge iron process, but final arrangements have not yet been made. The engineer in this case is the Salem Engineering Co. Ltd., Toronto, Ont. In the meantime, the only current operation in Venezuela is that of a small rolling mill at Caracas which is making concrete reinforcing bars out of scrap.

A sidelight on this whole expansion program is that the important jobs are planned by United States engineering firms but, due to difficulties in obtaining equipment from the U. S., contracts tend to go to European firms.

Tool Subs Reach 20 Per Cent

More than 20 per cent of the nation's machine tool production is now subcontracted, says Tell Berna, general manager of the National Machine Tool Builders' Association. This represents a higher proportion of output than was reached at any time during World War II, he says.

In a speech before the Engineers' Society of Western Pennsylvania, Mr. Berna said that machine tooling is such an exacting process that not all metalworking plants can do it. He referred to the on-again-off-again Bullard Co. subcontract to Fisher Body Division of General Motors (see STEEL, Feb. 4, 1952, p. 59). He said that the order for 757 Bullard vertical turret lathes was more than the Connecticut firm could handle, so Fisher was asked to subcontract.

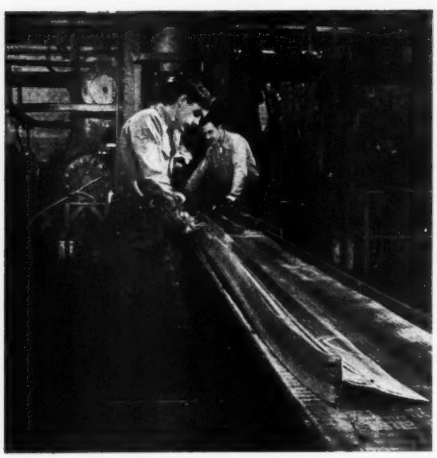
The body making firm had to install new precision equipment and hire skilled workers for the job, all of which put their price above Bullard's. This caused a postponement of the project during which time the government estimate changed.

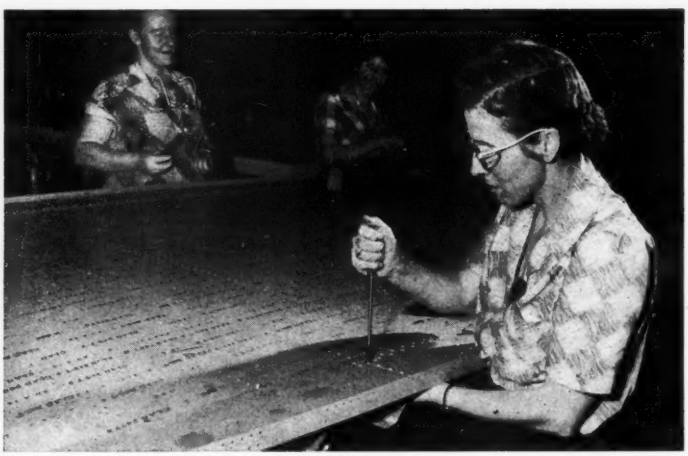
Tool Pool Orders Over Billion

With a new Cincinnati Milling and Grinding Machines Inc. contract for 9576 machine tools costing $165,361,020, the total value of tool pool order contracts entered into with manufacturers by the General Services Administration is slightly over the billion-dollar mark, says Jess Larson, administrator of general services. The previous total reported by GSA was about $855 million.

Tool Recovery Program Pushed

New impetus is coming for a program to recover machine tools and other equipment previously donated or sold to educational in-





PIG TO PLANE: Just 27 days after the first 1000-pound aluminum pig entered the new Kaiser Aluminum & Chemical Corp. Chalmette reduction plant, it was delivered to the Consolidated Vultee Aircraft Corp. as finished extrusions. After leaving Chalmette, it was sent to Kaiser's Halethorpe, Md. plant to be remelted, alloyed, cast into billets and formed, left, into 50 structural shapes for a B-36 bomber. At right, a B-36 wing bulkhead on which Kaiser beveled Aluminum extrusions are attached as stiffeners is assembled at Consolidated Vultee's Ft. Worth, Tex. plant

stitutions by the U. S., mainly through the old War Assets Administration.

The program first got underway last fall, bogged down for a while, but now is being pursued more vigorously. Representatives of NPA, the Federal Security Agency and the Department of Defense are touring the country to find what tools are available. A Machine Tool & Equipment Allocation Board, composed of one principal and one alternate from NPA, the Munitions Board and each of the military departments, will consider the lists of tools found and allocate such equipment.

Firm to Extract Manganese

Ohio Manganese Inc., Youngstown, has just received a certificate of necessity granting it five years to amortize 80 per cent of the cost of a new plant to extract manganese from open hearth slag. Estimated cost is $2,250,000.

The firm, headed by Maurice W. Joyce, has been conducting experiments for several years on taking out the manganese, and has worked in close co-operation with Youngstown Sheet & Tube Co., Bethlehem Steel Co. and others.

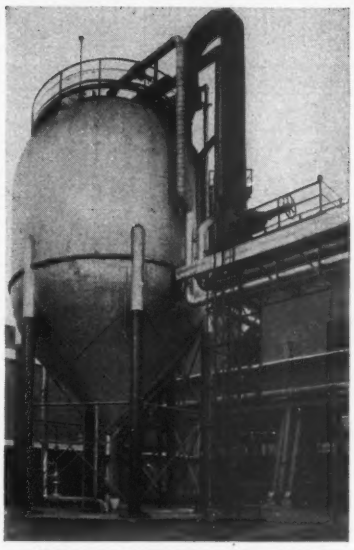
Railroads Top Write-off List

Railroads and public utilities received the majority of certificates of necessity issued by DPA for the four-week period to Jan. 18. Of $740 million worth of certificates, railroads got fast write-off on $415 million of new or expanded facilities. Consumers Power Co., Flint, Mich., headed utilities list with about $49 million for expansion.

C&O, Southern Call for Bids

Two railroads have called for bids totaling $14.1 million to buy new equipment, mostly diesel locomotives. Chesapeake & Ohio Railroad has called for equipment trust certificates valued at $8,250,000 to purchase diesel electric locomotives, freight engines, electric road switches, hoppers and gondolas.

Southern Railway has set Feb. 20 as the deadline for bids on its equipment certificates totaling $5,850,000. This money will help to buy 49 new diesel locomotives.



LIME-SODA-PHOSPHATE SOFTENER
. . . harder water—more conditioning

Conditioned Water

Industry is using more and more of it to prevent corrosion and boost efficiency

"WATER, water, everywhere . . ."

That line from *The Ancient Mariner* is no longer true in this age when the water table is dropping. The lower the water level the harder the water and the greater the need for water conditioning equipment. That's one big reason why makers of the apparatus expect sales of about $55 million this year, compared with $50 million in 1951, $30 million in 1949 and less than $15 million in 1939.

On Shoulders of Industry—The increasing water requirements of American industry will account for much of the gain in water conditioning equipment sales during 1952, not only to demineralize the hardening water, but to purify the liquid too because companies are being forced to turn more and more to polluted waters in lakes, rivers and streams for their supplies. About 15 companies fabricate and/or assemble industrial water conditioning equipment. Another 100 or more supply domestic equipment. All find their best markets in 29 states, mostly between the Appalachians and Rockies, which have the hardest water.

Permutit Co., New York, is the biggest firm in both the domestic and industrial field. It makes a complete line of conditioning equipment including Zeolite water softeners which uses the principle of ion exchange to demineralize hard water. Besides ion exchange equipment (currently one of the best sellers in the business), the industry makes deaerators, filters, chemical feed equipment, precipitation apparatus, degasifiers, boiler feedwater equipment and many other lines. Companies specializing in industrial water conditioning work on an engineering basis and frequently must use several kinds of equipment to do a big job. Most don't make all types but subcontract some of their work.

Essential—Conditioned water is a must for much of industry today. Firms that have boiler systems need it to prevent scale. Platers are major users of conditioning equipment because processed water improves the performance of plating techniques. All other industrial users of water are becoming increasingly conscious of conditioning to curb corrosion and increase efficiency, points out Don Porth, sales manager of Culligan Zeolite Co., Northbrook, Ill.

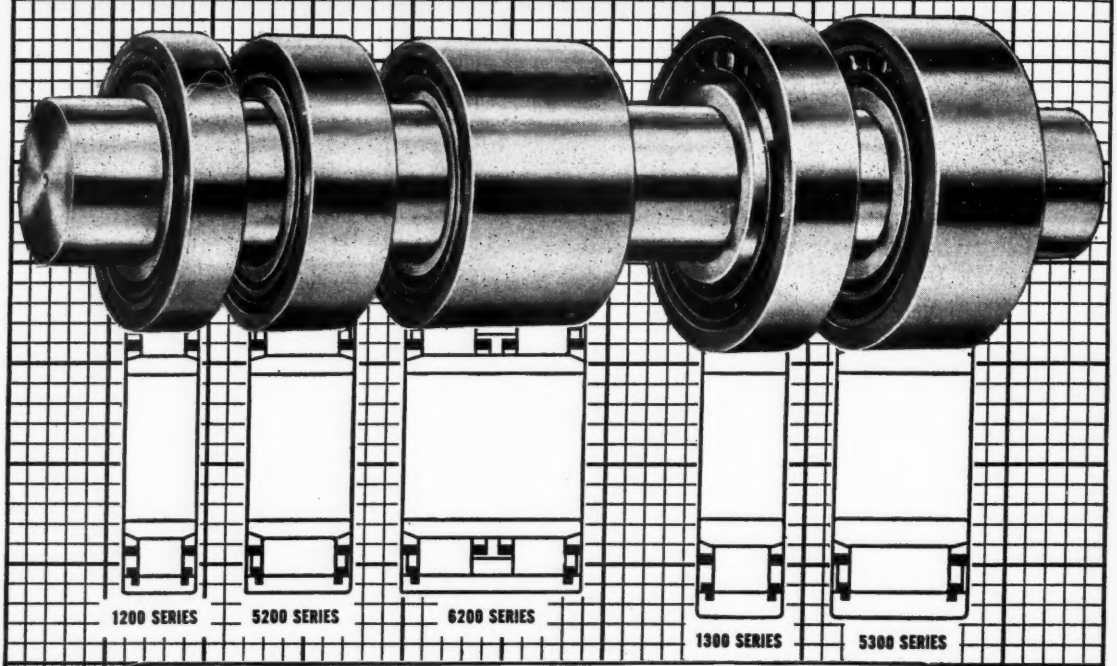
Water conditioning systems cost anywhere from $150 to $1 million, depending on what's involved. Today, atomic energy installations are the most expensive. H. D. MacLellan, Chochrane Corp.'s Pittsburgh sales engineer, says that a hot-process system delivering 12,000 gallons an hour (an average installation) would cost about $40,000. Many water conditioning systems can pay for themselves within four years.

AMA Opens Training Center

A six-unit management training program designed for executives who have had fairly substantial experience is being offered by the American Management Association in its new Management Training Center in the Hotel Astor, New York.

Lawrence A. Appley, president of AMA, says that the first one-week unit has a capacity registration of 135 executives. Those who complete the first course will be eligible for the other five.

HYATT HY-LOADS
Five Types—A Common Shaft



With a large selection of bearing types from which to choose, Hyatt Hy-Loads help make your design job easier.

For instance, here are five Hy-Load Bearings—all different in size and load-carrying capacity, yet all fitting a common shaft.

When the loads are light you can economize in space, cost and weight and use a narrow width bearing of our light, (1200) series.

When the loads are heavy and the outside diameter is limited, you can choose a wide (5200) or duplex width (6200) bearing of this same light series.

And when the loads are heavy and the axial space is not available, you can still provide for increased capacity with the medium (1300 or 5300) series Hy-Load Bearing which has a larger over-all diameter.

These five combinations, available in most standard bearing bore sizes, illustrate just one of the many types and sizes of Hyatt Roller Bearings as shown in Hyatt Hy-Load Catalog #547. For your copy write to Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Automen are still wrestling with the plating problem. Knight Plating Co.'s adaptation of the "white brass" technique may work in mass production

DETROIT

ALMOST BUT NOT quite within the automotive industry's grasp is a nickel-less, copper-conserving plating material. With some of the largest platers reported to be out of nickel except for that presently in their tanks and no other finish ready to do the job as well, intense interest is being displayed in so-called "white brass" plate.

Still Experimental — Considerable progress has been made in evaluating white brass since its adoption for certain small automotive interior parts was disclosed in STEEL, (Aug. 6, 1951, p. 57), and a great deal of effort has been expended in the hopes of developing a plating technique which would widen application of white brass to such large items as grilles, bumpers, hubcaps and other trim. A good many of the important suppliers of plating materials have developed white brass formulas, but so little is known about plating successfully with it that development for the most part still is in the experimental stage.

Most ardent, and successful, devotee of white brass plating is Knight Plating Co., Detroit, whose specialty is barrel or bulk plating of screws and other small parts. Webster B. Knight's plant has been white-brass-chrome plating screws at a rate of about 160 million a year. But three months ago he set up an experimental still tank to run larger parts. Presently Mr. Knight is supplying grilles, hubcaps, and door handles to automakers for roadtesting.

Exposure — In salt-spray tests, his still-tank plated parts got through 40 hours' exposure before white corrosion products began to show on the white brass. If not washed off at this point, by 50 hours an abrasive cleaner is required to clean off the film. Automakers' specifications generally call for 16 hours' minimum under the salt spray. Red rust is not encountered, and neither is the bleed-through which quite often occurs when chrome is plated directly over copper.

Mr. Knight is not disclosing exactly what his plating ingredients or techniques are. He will say that for barrel plating a cyanide type of solution with "certain brighteners and addition agents," plus zinc and copper anodes, is used. Eighty per cent zinc and 20 per cent copper is required in his formula. Some formulas call for four points more of copper, and some for several points more zinc. In his still tank work, he found it necessary to add a secondary brightener which not only increases the bright range, promotes anode corrosion and gives some grain refinement to the alloy plate, but also retards the surface tarnishing characteristics which had previously made prompt chrome flashing advisable. Several grille sections in the Knight plant show no tarnish and display mirror brightness although they are devoid of the chrome flash.

Good Points — As Mr. Knight plates white brass, he eliminates the traditional copper undercoat altogether and plates directly on the base metal, subjecting it to a preliminary polishing operation only if objectionable tool marks occur. In plating without this initial copper coating he saves about 80 per cent of the copper normally required since his white brass plate of about 0.0003-inch thickness contains only 20 per cent copper whereas 100 per cent copper of that thickness would be required for a chrome-copper or chrome-

LABRADOR RETRIEVERS: GMC trucks are playing an important part in the construction of the 365-mile railroad being constructed to bring iron out of the Knob Lake area of Labrador and Quebec. Model 720 dump truck with Coleman front end, left, is hauling gravel at Seven Islands, Quebec, terminal of the road. The model 988 diesel, center, is hauling bags of flour to be distributed to 11 camps along the first 100 miles. At right, provisions are transferred from a GMC truck to a helicopter used to transport materials across the wilderness to isolated camps

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nickel-copper plate. Time of the white brass plating cycle conforms closely with that required only for the copper in the traditional cycle. With the same equipment, Mr. Knight estimates, prospects are that production can be stepped up from 50 to 100 per cent exclusive of the time saved by omitting the polishing operations. And these are not the only economies. Materials costs are considerably less and all materials are readily obtainable.

Such savings are of utmost importance to automakers. It has been estimated that the substitutes currently employed on plated parts are costing $5 more per car than the former finishes. Vulnerability of the baked clear lacquer which is used to protect the chrome-copper finish is another reason why this is not working out with complete satisfaction.

Bad Points—Stumbling block for most platers who have done work with white brass has been its brittleness. Mr. Knight's ability to crush, twist and otherwise deform his parts without having the plate crack proves that it can be done and appears to be a reason why some of the largest platers, including automotive captive shops, have not thrown in the sponge and decided the whole thing is impossible.

Mr. Knight admits that the closest kind of control is necessary to get satisfactory results. At the present stage of development and with production on the level of a laboratory operation, the Knight still-tank plating is an oddity of unknown significance to a production set-up. A further step may be to establish a pilot plant operation to determine whether the system is capable of large-scale use.

Pros, Cons on Detroit Recession

Investigation by a government task force into the causes of Michigan's inability to mesh into a guns - and - butter type economy without excessive gear-clashing brought out solid agreement by the automakers on one point: Nothing can cure the area of its unemployment problem with rapidity except a larger allocation of materials for passenger car production.

General Motors' President C. E. Wilson cited the biblical story of the Egyptians being ordered to make bricks without straw. "We don't want any Egyptian schedules," he declared. His suggested production level to absorb the industry's unemployed calls for a second quarter quota of 1.1 million passenger cars and 273,000 trucks with a carte blanche for the necessary materials for this output. This compares with NPA's quota of 930,000 cars and 220,000 trucks —if the industry can get the materials.

Walter Reuther, UAW-CIO president, indicated his belief that a higher level of civilian production is of secondary importance — the vital thing is to get more defense work into the area. One of the ways other witnesses suggested this could be done is to forget about competitive bidding and spoon-feed contracts to the area's manufacturers.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,882
February	658,918	505,595
March	802,737	610,678
April	680,281	585,707
May	695,898	732,164
June	653,682	897,852
July	522,858	746,801
August	571,442	842,335
September	505,758	760,848
October	558,971	796,012
November	480,199	633,876
December	404,547	671,621
Total	7,180,979	8,393,371

Week Ended	1952	1951
Jan. 12	92,741	139,787
Jan. 19	98,669	161,867
Jan. 26	94,722	167,913
Feb. 2	101,504	150,984
Feb. 9	107,000*	116,020

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

A directive to this effect by the Comptroller General of the U. S. has aroused the fighting spirit of many Detroiters who, although concerned about unemployment, are also taxpayers and are concerned about the government getting a dollar's worth for every dollar it spends. William J. Cronin, managing director of the Automobile Manufacturers Association, told Defense Mobilizer C. E. Wilson by telegram last week that the industry wanted no hand-outs. "The industry has been seeking more defense work ever since the start of the Korean war, but it has not sought preferential treatment or subsidy of any kind and it is not seeking it today," he emphasized. Although, he added, "the government frequently receives the most efficient results from placing contracts for specialized military products on a negotiated basis."

Briggs-Chrysler Merger?

One of the current rumors which cannot be pinned down and which isn't spiked even by the denials of both parties, is that Briggs Mfg. Co. will be bought or merged with Chrysler Corp.

Some automen believe such an arrangement would be mutually advantageous, and it is pointed out that about half of Chrysler Division's bodies are currently built by Briggs. Through its plumbing ware division, Briggs' acquisition would furthermore give Chrysler entree into household line. This speculation was probably touched off by the recent death of Chairman Walter O. Briggs, and the company's delay in electing his successor.

Some Military Deliveries Gain

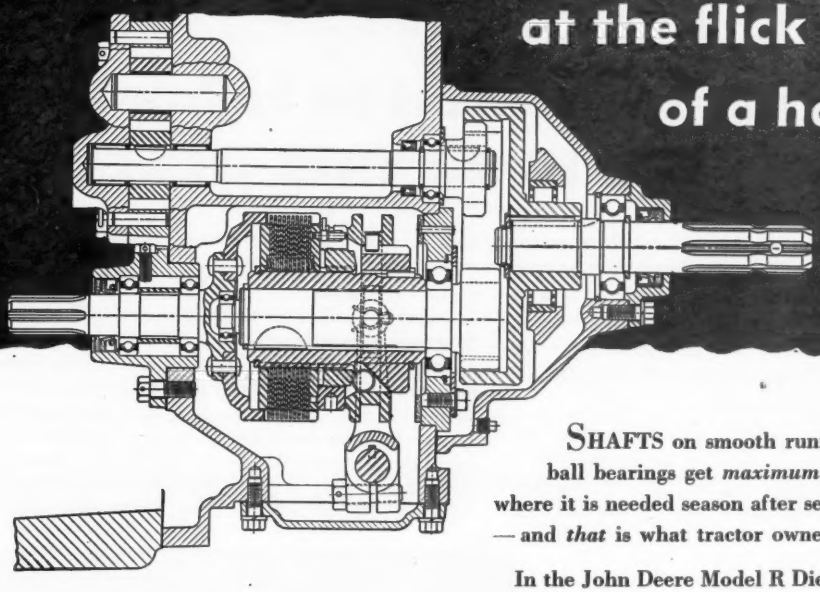
Step-up in military deliveries is being reported by several automakers who got into defense work early and were able to tool up from government stocks or before new tool deliveries became so extended.

Oldsmobile, in quantity production of bazooka rockets, and Chevrolet, with its 155-mm artillery ammunition order at St. Louis, are examples. Willys-Overland's employment this week will regain the World War II peak as the company prepares for large-scale manufacture of aircraft landing gears. In its six plants, according to President Ward M. Canaday, 14,483 people are employed, 15 per cent above the level of four months ago.

AC Defense Employment Goes Up

About 20 per cent of the employees at AC Spark Plug Division, General Motors Corp., presently are engaged in defense production, even though total employment at AC is up 300 per cent over a year ago. This means 2200 AC workers out of 11,000 are doing war work.

Back Saving Power at the flick of a hand



Direct engine-driven Power Take-off and Hydraulic "Powr-Trol" pump for operation of attachments to the John Deere Model R Diesel Tractor are engaged or disengaged at will by an independent clutch.

SHAFTS on smooth running New Departure ball bearings get *maximum* power right thru to where it is needed season after season without change — and *that* is what tractor owners really appreciate.

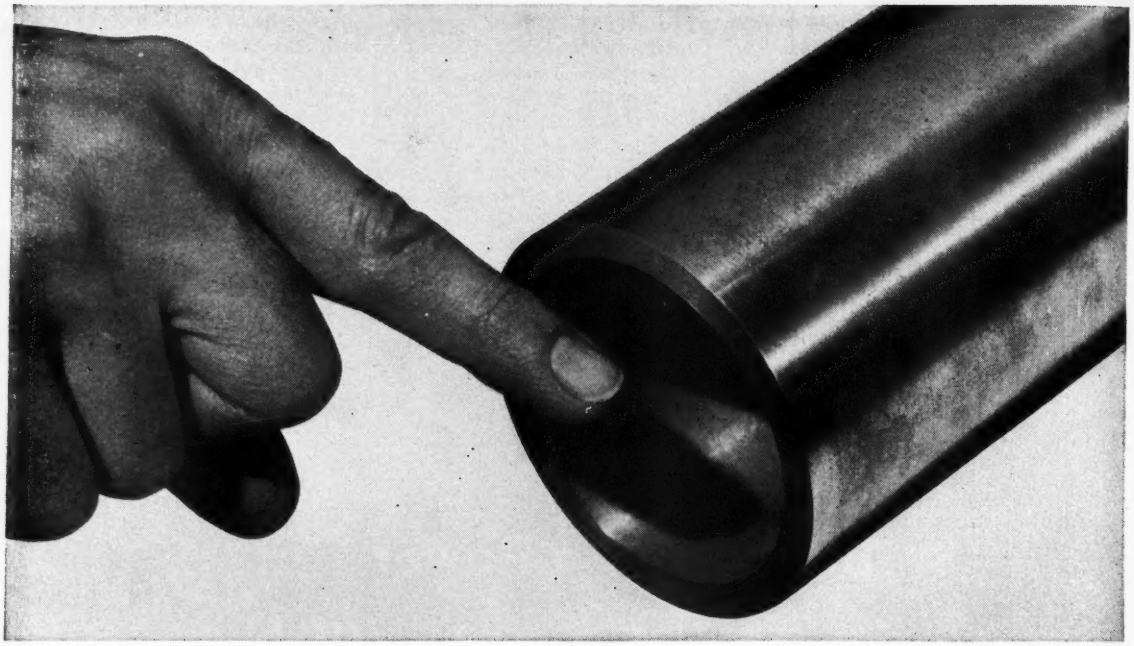
In the John Deere Model R Diesel, New Departures on the independent clutch, power take-off and hydraulic pump shafts assure back saving power at the flick of a hand for raising, lowering, angling or driving of attachments.

New Departure, Division of General Motors Corp., Bristol, Connecticut.

Nothing Rolls Like a Ball

NEW DEPARTURE BALL BEARINGS

158



If you want to save steel on hollow parts, YOUR ACE IS IN THIS HOLE!

WHEN you use seamless tubing for hollow cylindrical parts, the hole is already there. You machine away less scrap than you do with bar stock, get more parts per ton of steel. And to help you save *more* steel, the Timken Company offers a tube engineering service which recommends the most economical tube size for your job—guaranteed to clean up.

With Timken® seamless tubing, you make your machine tools more productive. Drilling the center hole is eliminated; finish boring is often your first production step. As a result, screw machine stations are released for other operations. You have more machining capacity without adding more machines.

Because the piercing process by which Timken tubing is made is basically a forging operation, you have fine forged quality in your product. The tubing has a uniform spiral grain flow for greater strength and a refined grain structure which brings out the best in the quality of the metal. And from tube to tube and heat to heat, this quality is always uniform due to the Timken Company's rigid quality control. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Business Trend

Pickup in basic industrial production and increasing recognition of the need for a healthy civilian economy suggest a general business upturn by spring

FIRST SIGNAL for a general business upturn by spring could well be the increased tempo of industrial activity early this month.

Slight as the rise might be, it must be viewed in the light of static conditions of the past few months. The production gain of early February was greater than the average week-to-week variation of December and January.

Hopeful Sign — Evidencing this rise, STEEL's industrial production index in the week ended Feb. 2 registered 209 (1936-1939=100). Gain in that week of four points marked the sharpest upward movement—on a seasonal adjusted basis —since early December.

Compare that upturn with the economic stability characteristic of December and January. Federal Reserve Board's index of total production was pegged at 218 per cent of the 1935-1939 average in December and stayed at about that level in January. Thus FRB's index hasn't changed in five months, and didn't vary by more than 11 percentage points throughout 1951. Average for the year was 220.

Long Division—Among the factors pointing to a spring business improvement, perhaps the most significant is a growing realization that the civilian segment of the economy won't be squeezed dry by the rearmament drive. Government policy tends more and more in the direction of temperance in considering materials allowances.

Even if this decision is only a temporary political expedient, the increased supply of metals next fall after elections will assure a greater share to nonessential users —even though arms and plant facility needs remain high or increase. In co-ordination and timing of mobilization's shifting needs, there is greater recognition of the value of a healthy civilian economy in the immediate future as well as in the long-range pattern.

Near-Record Tonnage . . .

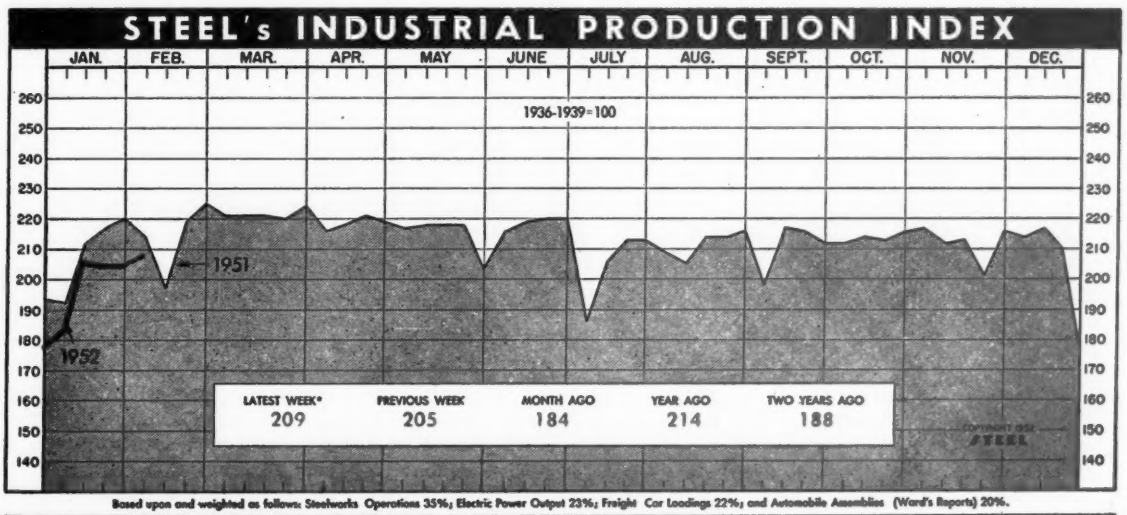
Faster tempo in manufacturing industries must be dependent on adequate supplies of metals for fabrication. Steel mills are doing their part in pouring forth that vital metal. They've operated close to the capacity mark since the beginning of the year, and in the week ended Feb. 9 were scheduled to turn out a near-record 2,090,000 net tons of ingots and castings steel.

Speedup Needed . . .

Further buildup of auto assembly operations is scheduled for the rest of February. U. S. production of autos in January—284,100 units—was well below the target of 316,000 outlined by NPA allowances. February schedules call for 344,400 auto and 105,000 truck completions in February, according to *Ward's Automotive Reports*. Preliminary figures for January show 103,400 trucks were erected. U. S. and Canadian production in the week ended Feb. 2 set a new high for 1952, says *Ward's*. But that week's total of 101,504 cars and trucks shows output has yet to reach desired levels. The NPA ceiling of 1,006,000 cars in the first quarter can be reached without great production pressures late in the quarter if Independents push operations and labor troubles quiet.

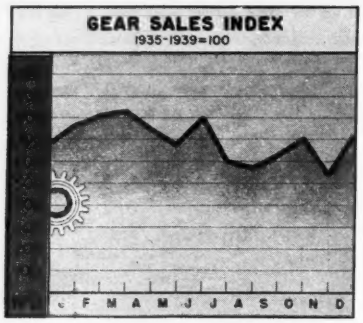
Shifts in Construction . . .

Construction activity is at near-record levels and still climbing, but there has been a decided shift in type of building in the past year



Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

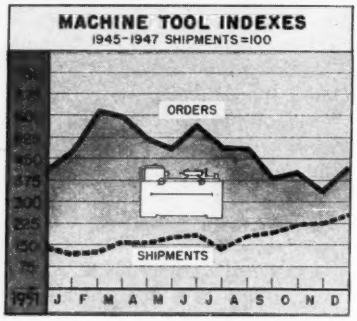
*Week ended Feb. 2



Gear Sales Index
1935—1939=100

	1951	1950	1949
January	764.6	280.2	320.7
February	809.1	272.9	282.3
March	830.7	358.4	299.1
April	742.5	328.6	339.0
May	667.1	363.1	250.1
June	800.9	401.0	227.8
July	589.1	410.7	193.1
August	564.2	617.4	262.0
September	630.1	654.5	224.9
October	703.4	564.8	242.3
November	530.0	554.9	230.7
December	716.5	680.4	242.8

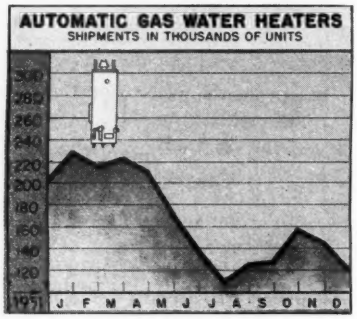
American Gear Mfrs. Association.



Machine Tool Indexes

	New Orders		Shipments	
	1951	1950	1951	1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	590.3	107.4	158.9	75.3
Apr.	516.1	98.9	157.7	61.6
May	483.0	116.4	175.1	82.5
June	558.8	124.1	182.8	91.9
July	490.6	253.1	144.7	68.3
Aug.	488.9	305.1	178.9	95.7
Sept.	380.2	280.6	189.8	101.6
Oct.	403.9	289.6	221.3	100.9
Nov.	330.5	291.9	226.0	110.9
Dec.	416.8	410.1	253.9	135.7

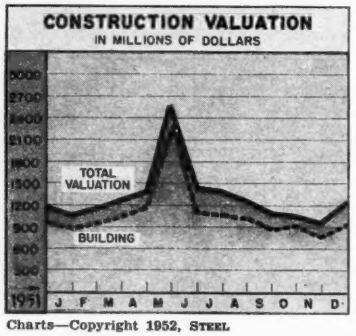
National Machine Tool Builders' Assn.



Automatic Gas Water Heaters
Shipments in Units

	1951	1950	1949
Jan.	225,600	131,600	88,400
Feb.	213,400	156,500	84,500
Mar.	223,300	172,800	106,000
Apr.	199,400	176,400	115,200
May	167,400	195,200	120,200
June	131,500	207,100	132,200
July	102,400	197,500	114,400
Aug.	124,400	259,800	138,800
Sept.	130,900	222,600	147,300
Oct.	157,700	235,100	154,200
Nov.	145,300	206,000	138,300
Dec.	118,800	202,500	126,500
Total	1,931,200	2,363,100	1,466,000

Gas Appliance Mfrs. Assoc.



Construction Valuation
(37 States)—In Millions of Dollars

	Total		Building	
	1951	1950	1951	1950
Jan.	1,043.2	730.9	881.9	578.8
Feb.	1,140.5	779.5	962.3	627.0
Mar.	1,267.4	1,300.2	1,043.8	1,075.3
Apr.	1,375.0	1,350.5	1,108.9	1,123.5
May	2,573.0	1,347.6	2,295.0	1,083.0
June	1,408.9	1,345.5	1,098.4	1,072.0
July	1,379.8	1,420.0	1,084.7	1,162.2
Aug.	1,262.8	1,548.9	1,043.5	1,295.1
Sept.	1,082.9	1,286.5	884.2	1,048.3
Oct.	1,051.4	1,135.8	914.4	956.7
Nov.	931,768	1,087.1	771,590	931.6
Dec.	1,234,339	1,169.4	939,111	969.0
Total	15,751.6	14,501.1	13,027.9	11,922.5

Charts—Copyright 1952, STEEL

Issue Dates of other FACTS and FIGURES Published by STEEL:

Durable Goods Feb.4	Indus. Production...Jan.14	Ranges, Elec. Dec.24
Employ., Metalwkg. Jan.28	Ironers Jan.21	Refrigerators Dec.24
Employ., Steel Jan.28	Malleable Castings..Dec.31	Steel Castings Dec.31
Fab. Struc. Steel...Feb.4	Prices Jan.14	Steel Forgings Dec.31
Foundry Equip. ...Jan.21	Pumps Dec.10	Steel Shipments Dec.17
Furnaces, Indus. ...Jan.21	Purchasing Power..Feb.4	Vacuum Cleaners ..Feb.4
Freight Cars Jan.28	Radio, TV Jan.21	Wages, Metalwkg...Jan.28
Gray Iron Castings.Dec.31	Ranges, Gas Dec.24	Washers Jan.14

and a half. Despite shortages and added controls, new construction in January reached $2.1 billion, a slight increase over the same month in 1951, the Commerce Department reports.

Military, industrial and public utility construction is bolstering the high level of outlays, while private housing, commercial building and highway construction is dropping off. Private construction ($1460 million) was 8 per cent below January, 1951, but public construction ($667 million) was 31 per cent higher. Private industrial building totaled $179 million (up 39 per cent) and public industrial building amounted to $83 million (up 131 per cent). Private residential building was off 20 per cent, but public housing was up 131 per cent. Military construction was nearly six times the year-ago volume.

Sales, Orders, Inventories . . .

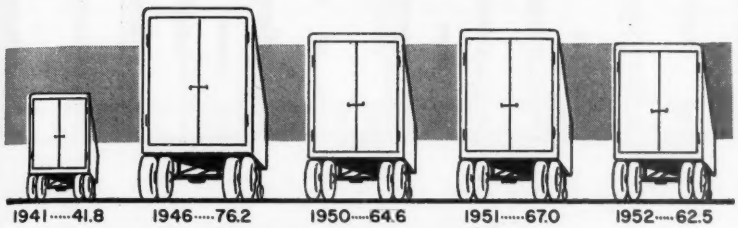
Manufacturers' dollar sales increased 16 per cent in 1951, to $265 billion, says the Office of Business Economics. About three-fourths of the advance represented higher prices and only one-fourth a gain in volume. Sales of durable goods industries rose 18 per cent to $125 billion, with all major industries in the group showing gains. Nondurable-goods industries sold 14 per cent more—$140 billion. December sales were off about 4 per cent from November.

New orders placed in December topped sales but were smaller than November orders. Rise in unfilled orders of $300 million during December brought the total value of backlogs at yearend to $62.2 billion—a 50 per cent jump in 12 months.

Inventories at yearend were estimated at $41.9 billion, seasonally adjusted. Addition in book value of $8.6 billion for the year was the largest increase on record in both dollars and volume of goods. December inventory valuation increased by only $200 million, reflecting the slowdown of inventory advance in the fourth quarter. Higher prices accounted for only about 10 per cent of the year's inventory valuation increase. Durable goods industries accounted for

Truck Trailers: No Production Pickup in '52

(Annual Production—Thousands of Units)



1951 preliminary; 1952 estimated. Source: Truck-Trailer Mfrs. Assoc.

more than two-thirds of the book value increase. At yearend, durables producers' inventories totaled $22.6 billion and nondurable producers' inventories $19.3 billion.

Watching Its Dollars . . .

A good indication that the public has been watching its dollars is seen in installment buying figures. While consumer installment credit jumped $2.3 billion in 1949 and another $2.6 billion in 1950, 1951's increase amounted to only $29 million, says the Federal Reserve Board. Total consumer credit outstanding at yearend was figured at $20.6 billion, a gain of $513 million in one year. Automobile installment credit declined in the last quarter while charge accounts rose $397 million during December. Charge accounts for the entire year swelled by about $348 million.

Trends Fore and Aft . . .

Major credit problems in manufacturing and wholesale fields in 1952 will concern general areas of working and long-term capital, slower collections, inventories and marginal accounts, says Credit Research Foundation . . . A National Industrial Conference Board survey of 131 manufacturers shows most expect first half billings will be increased through volume rather than higher prices . . . More than 2 million workers were disabled by work injuries during 1951 . . . Factory layoffs dropped sharply in December . . . New business incorporations last year were lowest in six years . . . Bituminous coal stocks on hand Jan. 1 would sustain industry 57 days.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	99.5	99.5	101.5
Electric Power Distributed (million kwhr)	7,752	7,616	6,969
Bituminous Coal Output (daily av.—1000 tons)	1,871	1,888	1,857
Petroleum Production (daily av.—1000 bbl)	6,100[1]	6,194	5,938
Construction Volume (ENR—millions)	$212.5	$309.3	$235.1
Automobile, Truck Output (Ward's—units)	101,504	94,722	150,984
TRADE			
Freight Car Loadings (unit—1000 cars)	740[1]	728	784
Business Failures (Dun & Bradstreet, number)	164	142	159
Currency in Circulation (millions)[3]	$28,347	$28,342	$27,045
Dept. Store Sales (changes from year ago)[3]	−14%	−14%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,783	$17,208	$16,547
Federal Gross Debt (billions)	$259.6	$259.3	$256.1
Bond Volume, NYSE (millions)	$15.7	$16.3	$25.9
Stocks Sales, NYSE (thousands of shares)	8,975	9,202	14,247
Loans and Investments (billions)[4]	$73.6	$74.2	$70.4
United States Gov't. Obligations Held (billions)[4]	$32.2	$32.3	$32.4
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	262.2
All Commodities[7]	176.3	175.9	182.1
Metals and Metal Products[7]	192.6	191.5	188.0

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1926=100.

For Fast Dependable WAREHOUSE SERVICE

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- COLD FINISHED BARS—Rounds Hexagons, Flats and Squares
- ALLOY COLD FINISHED BARS
- HOT ROLLED BARS—Rounds Flats and Angles
- STRUCTURALS—Channels Angles and Beams
- HOT ROLLED PLATES
- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
- YOLOY PRODUCTS—Angles Flats, Plate and Sheets
- DEFORMED REINFORCING BARS
- WELDED WIRE MESH
- SOFT BLACK ANNEALED WIRE
- BRIGHT BASIC WIRE AND WIRE RODS
- WIRE ROPE AND FITTINGS

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Men of Industry

WILLIAM H. TAYLOR
. . . gen. sales mgr. of Tinnerman

William H. Taylor, formerly director of engineering and assistant to the vice president of **Tinnerman Products Inc.,** Cleveland, was appointed general sales manager. He joined the company in 1945 as a salesman, and later became sales manager of the Detroit office.

Homestead Valve Mfg. Co., Coraopolis, Pa., elected **Don H. Krey** vice president-sales, and **John W. Force,** vice president-engineering.

Leo G. Cover retired as manager of **General Electric Co.'s** two wire producing factories, the Cleveland Wire Works and Dover Wire Works, Dover, O. He completes 42 years of association with GE. He is succeeded by **Herman L. Weiss,** who has been assistant manager of the two plants.

Richard B. Wyatt was named Pittsburgh district manager of **E. F. Hauserman Co.** He transfers from Boston.

W. E. Bikle is assistant vice president in the Chicago office of **Standard Railway Equipment Mfg. Co.** He has been in Washington for the past year on loan to the railroad equipment division of NPA.

Baron Steel Co., Toledo, O., appointed **Stewart C. Rogers** district manager succeeding **J. Mikolajczak,** who has joined Kaiser-Frazer Corp.'s purchasing department.

Donald D. Barnes was named president and treasurer of **Smith Engineering Works,** Milwaukee, to succeed the late **Charles F. Smith.** Mr. Barnes was executive vice president.

WILLIAM J. FITZBURGH
. . . new president of Diamond Power Specialty

William J. Fitzburgh was elected president, and **Willis P. Thomas,** chairman of **Diamond Power Specialty Corp.,** Lancaster, O. Since 1950 Mr. Fitzburgh has been executive vice president.

George C. Wilder was elected vice president and assistant general manager, **Macwhyte Co.,** Kenosha, Wis. He has served as assistant to the general manager since 1949.

Phelps Dodge Copper Products Corp., New York, appointed **Fabian W. Kunzelmann** manager, electrical manufacturer sales; **Carl D. Dimity,** manager, utility sales and engineering; **W. K. Dunbar Jr.,** manager, electrical distributor sales; and **J. C. Williams,** manager, rod and wire sales.

Victor Mancuso was elected executive vice president and assistant general manager, **Axelson Mfg. Co.,** Los Angeles. He formerly was vice president-manufacturing.

D. Clark Struble was elected vice president-purchasing, **American Meter Co. Inc.,** Erie Pa. He has been general purchasing agent since 1946.

W. F. Leonard, secretary of **American Society of Lubrication Engineers,** and **Patricia F. Leonard,** managing editor of *Lubrication Engineering,* have resigned effective March 1.

W. S. Andrews was appointed New York district sales manager for **Rockwell Mfg. Co.** to succeed **M. J. Harper,** recently promoted to co-ordinate sales for Boston, New York and Philadelphia territories.

LESTER C. HIGBEE
. . . new president of W. & L. E., Gurley

Lester C. Higbee was elected president of **W. & L. E. Gurley,** Troy, N. Y., manufacturer of engineering and scientific instruments. **Charles E. Smart,** the retiring president, will serve as chairman of the board. **Robert G. Betts** was elected to the newly created position of executive vice president as well as treasurer. **Daniel Harkness** was named secretary, and **William A. Rockefeller,** assistant treasurer. Prior to his election Mr. Higbee served as director of engineering and general sales manager, as well as secretary. New members of the board are: **Charles S. Aldrich, Charles G. Estey, Henry E. Lundquist** and **Gordon W. Phelps.**

Gould-National Batteries Inc., Trenton, N. Y., appointed **George F. Walsh** its sales promotion manager. For the last four years he occupied a similar position with Baldwin-Lima-Hamilton Corp.

David Larkin, former executive vice president, **Broderick & Bascom Rope Co.,** wire rope manufacturer, St. Louis, was elected to the board. **A. A. Grosse,** assistant treasurer, was elected to the additional office of secretary, a position formerly held by **J. H. Bascom,** now executive vice president-treasurer.

Ross E. Willis, associated with the sales department of **Mesta Machine Co.,** Pittsburgh, since 1931, was elected a director of the company.

Chester H. Lehman, identified with **Blaw-Knox Co.,** Pittsburgh, for 42 years, retired as executive vice president. He continues as a director and vice chairman of the board, and will

also serve in an advisory and consulting capacity.

Lewis P. Wilson, now chief metallurgist, St. Louis Ordnance plant, **U. S. Defense Corp.,** division, Olin Industries, St. Louis, formerly was with the research department, Western Cartridge Co., division of Olin Industries, East Alton, Ill.

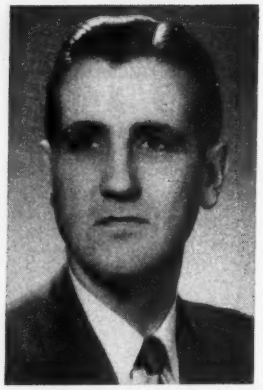
General managers of newly created integrated operating divisions of **Olin Industries Inc.** include: **M. W. Acker,** Olin director and vice president, named general manager, metals division, with headquarters at East Alton, Ill., and New Haven, Conn. **M. F. Meissner** is assistant general manager. **W. C. Schade** is general manager, arms and ammunition division, New Haven; **W. S. Allen,** electrical division, New Haven; **N. A. Hamilton,** explosives division, East Alton; **O. E. Nelson,** export division, New Haven, where **A. K. Lang** is assistant general manager. **G. L. Dawson** was appointed staff assistant to the executive vice president, for whom he will execute special assignments.

Edward R. Devlin was appointed general manager in charge of operations and sales of **Atlas Iron & Steel Co. Inc.,** Philadelphia.

W. J. Riley was appointed general production manager, steel division, **Ford Motor Co.,** Dearborn, Mich. He is responsible for steel production activities including open-hearth, rolling mill, blast furnace and coke oven operations.

William G. Thannert was named factory manager, **Trackson Co.,** Milwaukee. He was previously general planning superintendent at Caterpillar Tractor Co., of which Trackson is now a subsidiary.

WILLIAM G. THANNERT
. . . Trackson Co. factory manager



GERALD F. SINDELAR
. . . sales mgr. of Variety Machine & Stamping

Gerald F. Sindelar was appointed sales manager, **Variety Machine & Stamping Co.,** Cleveland. He has had many years of experience in the metalworking industry, and for the last five years was manager, appliance sales, Tinnerman Products Inc.

W. C. Boren Jr., formerly president, was elected chairman of the board of **Carolina Steel & Iron Co.,** Greensboro, N. C. **N. P. Hayes,** formerly executive vice president, becomes president. **W. C. Boren III** was elected vice president.

G. D. Holiday was appointed purchasing agent, **Burgess-Norton Mfg. Co.,** Geneva, Ill. **J. W. Moore** continues as assistant purchasing agent.

George L. Ratcliffe was elected a vice president of **National Lead Co.,** New York.

Rust Furnace Co., Pittsburgh, appointed **O. D. Rice** manager of operations. He is succeeded as chief engineer by **H. Hayward Dinneen. L. G. Meier** is chief draftsman and **R. W. Ewalt,** assistant sales manager.

New head of the mechanical engineering department of **Sam Tour & Co. Inc.,** New York, is **Henry N. Sholket.**

Ettco Tool Co. Inc., Brooklyn, N. Y., appointed **A. E. Stehle** Midwest district manager in its Chicago office.

A. B. Bechaud was named executive vice president, **Ben-Hur Mfg. Co.,** Milwaukee. He organized the Ben-Hur freezer division in 1943 and was named vice president in 1948.

P. A. Collins was named executive assistant chief engineer, **Chevrolet Motor Division,** General Motors Corp., Detroit. Two assistant chief engineers also appointed are **E. J. Premo,** in charge of design engineering, and **C. W. Frederick,** in charge of experimental and production engineering. **W. T. Burell** succeeds Mr. Frederick as chassis design engineer, while **E. J. Luxmoore** succeeds Mr. Premo as body design engineer.

Howard Terhune joined **Loewy Construction Co. Inc.,** New York, a subsidiary of Hydropress Inc., as project design engineer in charge of the counter-blow hammer division.

Dr. George O. Curme Jr. was elected a director of **Union Carbide & Carbon Corp.,** New York, to succeed the late **James A. Rafferty,** vice president and director.

Harold Kirkpatrick, since 1948 vice president, **Marsh Steel Corp.,** North Kansas City, Mo., was elected a director.

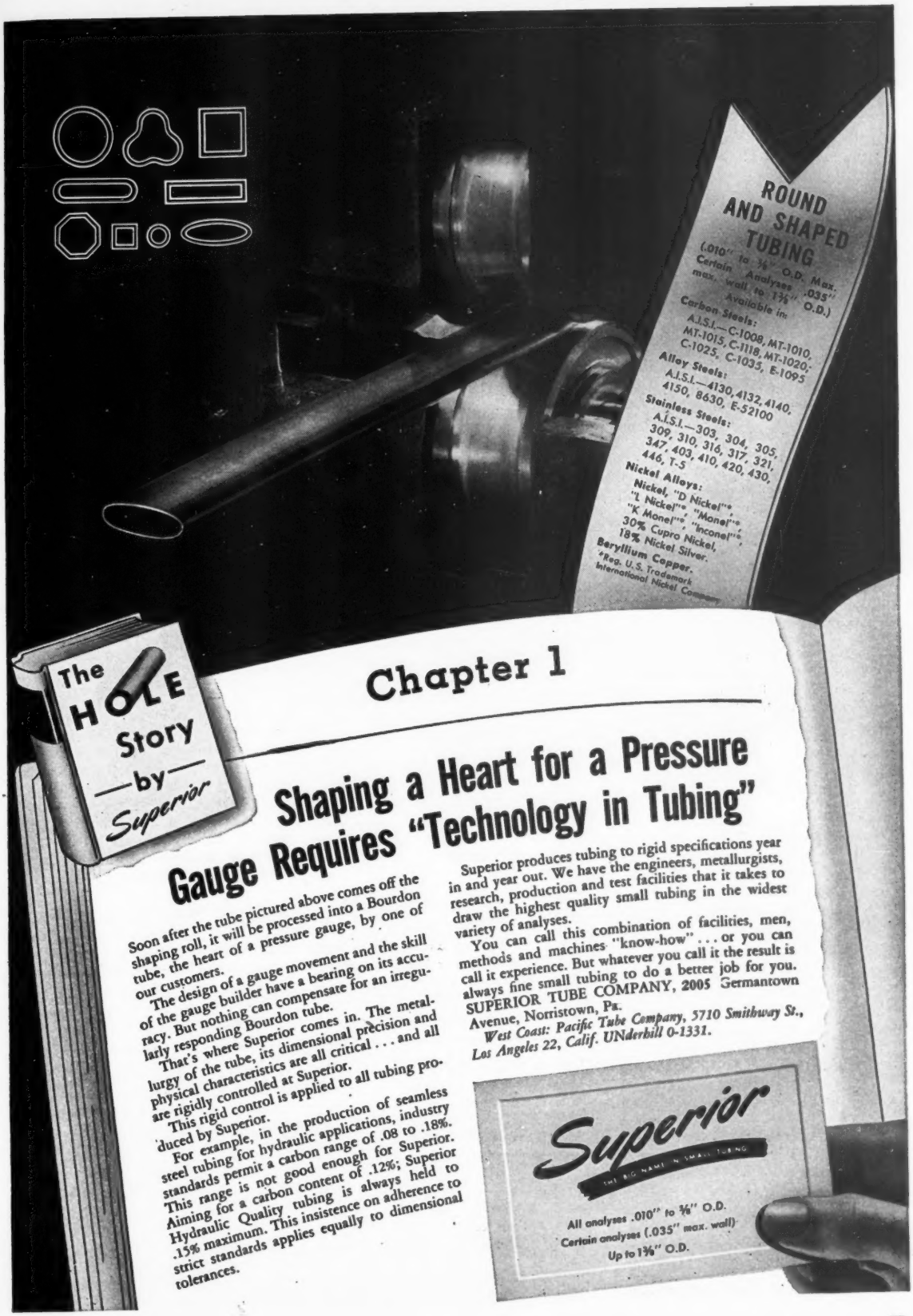
J. E. Hovis, in charge of sales, production and development, **Bloom Engineering Co. Inc.,** Pittsburgh, was named general manager. **H. J. Howe,** office manager in charge of finance and personnel, was appointed secretary.

Fred A. Rueter was appointed eastern sales manager, **Malsbary Mfg. Co.,** with headquarters at Pittsburgh.

L. D. Chirgwin, vice president-manufacturing, Farrel-Birmingham Co., was appointed executive vice president, **Consolidated Machine & Tool Corp.,** Rochester, N. Y. The two firms recently merged.

Harold B. Ridgley, previously assistant superintendent, was promoted to tooling superintendent of **Texas Engineering & Mfg. Co. Inc.,** Dallas. He joined the company in 1946 and pre-

HAROLD B. RIDGLEY
. . . tooling supt. of Temco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The HOLE Story —by— Superior
Chapter 1
Shaping a Heart for a Pressure Gauge Requires "Technology in Tubing"
Soon after the tube pictured above comes off the shaping roll, it will be processed into a Bourdon tube, the heart of a pressure gauge, by one of our customers.
The design of a gauge movement and the skill of the gauge builder have a bearing on its accuracy. But nothing can compensare for an irregularly responding Bourdon tube.
That's where Superior comes in. The metallurgy of the tube, its dimensional precision and physical characteristics are all critical . . . and all are rigidly controlled at Superior.
This rigid control is applied to all tubing produced by Superior.
For example, in the production of seamless steel tubing for hydraulic applications, industry standards permit a carbon range of .08 to .18%. This range is not good enough for Superior. Aiming for a carbon content of .12%; Superior Hydraulic Quality tubing is always held to .15% maximum. This insistence on adherence to strict standards applies equally to dimensional tolerances.
Superior produces tubing to rigid specifications year in and year out. We have the engineers, metallurgists, research, production and test facilities that it takes to draw the highest quality small tubing in the widest variety of analyses.
You can call this combination of facilities, men, methods and machines "know-how" . . . or you can call it experience. But whatever you call it the result is always fine small tubing to do a better job for you.
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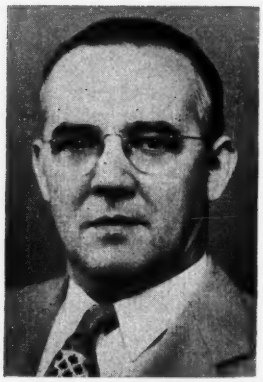
All analyses .010" to ⅜" O.D.
Certain analyses (.035" max. wall)
Up to 1⅜" O.D.

WEST CALLENDER
. . . West Virginia Steel & Mfg. purchasing

ROBERT N. NELSON
. . . sales mgr., Sundstrand pneumatic div.



FRED W. RICHARDSON
. . . gen. supt. of Heppenstall's Pittsburgh plant

viously was with the Texas division of North American Aviation Inc.

West Callender was appointed purchasing agent, **West Virginia Steel & Mfg. Co.**, Huntington, W. Va. He has been with Ashtabula Bow Socket Co. for the last three years.

Richard M. Burk was elected vice president, **Southwest Supply Co.**, Pittsburgh. He previously was with National Supply Co. for more than 23 years, where he served in various sales and executive capacities.

Jack M. Stone was appointed superintendent of the open-hearth department, **Ensley Steel Works**, Tennessee Coal, Iron & Railroad Co., Birmingham

Clarence Graham Sr. and **R. P. Williams Jr.** were appointed vice presdents of **Rheem Mfg. Co.**, San Francisco

S. Gordon Saunders resigned as general manager, cycleweld division, **Chrysler Corp.**, Detroit, to establish a consulting service in the field of industrial paints, plastics, adhesives, and sandwich panel construction.

S. C. Allyn, president, National Cash Register Co., was elected a director of **Armco Steel Corp.**, Middletown, O. He succeeds **E. A. Deeds**, resigned.

Robert N. Nelson, formerly assistant sales manager, was promoted to sales manager of the pneumatic division of **Sundstrand Machine Tool Co.**, Rockford, Ill. He joined Sundstrand as a sales engineer in the pneumatic division in 1946, and earlier this year became assistant sales manager.

Robert C. Brady, formerly director of research for Material Handling Institute Inc., Pittsburgh, joined **W. B. McClelland Co.**, Cleveland.

E. D. Williams was appointed production manager, engine assembly and test, and **E. C. Humphries** as production manager, engine machining at **Lincoln-Mercury Division's** gas turbine plant, Ford Motor Co.

General Steel Warehouse Co. Inc., Chicago, appointed **G. J. Zimmerman** general sales manager; **W. O. Buchanan**, sales manager, steel and brass warehouse sales; and **J. Van Horne**, sales manager, Gensco Tool Division.

Promotions announced by **Magnesium Co. of America**, E. Chicago, Ill., include **D. E. Harvey** as vice president and head of the Washington office; **William Johansen**, general sales manager, E. Chicago; and **C. J. Futterer**, head of the Houston offices.

Fred W. Richardson was appointed general superintendent of **Heppenstall Co.'s** Pittsburgh plant. He succeeds **Paul H. Daley**, recently named general manager of the 35-acre plant at Eddystone, Pa., which Heppenstall is reactivating to manufacture die blocks as part of the expansion program of the U. S. Air Force.

Herbert F. Lundstrom, formerly assistant plant manager, Oakland, Calif., factory, **American Can Co.**, was named manager of the company's new Stockton, Calif., plant. He is succeeded at Oakland by **Merle L. Smith.**

Herbert E. Fryer was named manager of sales for the newly formed Denver sales district, **Columbia-Geneva Steel Division**, U. S. Steel Co. With headquarters in Denver, he will manage sales of manufactured products of the division and other U. S. Steel operations in Colorado, Montana, New Mexico and Wyoming.

Russell F. Derr was appointed district sales manager, Detroit office, **Pittsburgh Steel Co.** He formerly was a member of General Motors Corp.'s manufacturing staff, purchasing and salvage section. He succeeds the late **A. D. Stevenson.**

OBITUARIES . . .

C. A. Kral, vice president in the engineering and construction division of **Koppers Co. Inc.**, Pittsburgh, died Jan. 31. For the last several years Mr. Kral was Chilean management representative for Koppers at the Pacific Steel Co. of Chile. He returned to the United States a few months ago and was to have gone back to Chile shortly.

T. C. Hoelzer, 60, vice president and manager, **Master Metals Inc.**, a subsidiary of National Lead Co., died Feb. 1 in Cleveland.

L. Gail Thomas, 55, purchasing agent, **Barber-Green Co.**, Chicago, died Jan. 31.

Harold W. Browne, 62, traffic manager for **Yale & Towne Mfg. Co.** in Stamford, Conn., for 27 years, died Feb. 3.

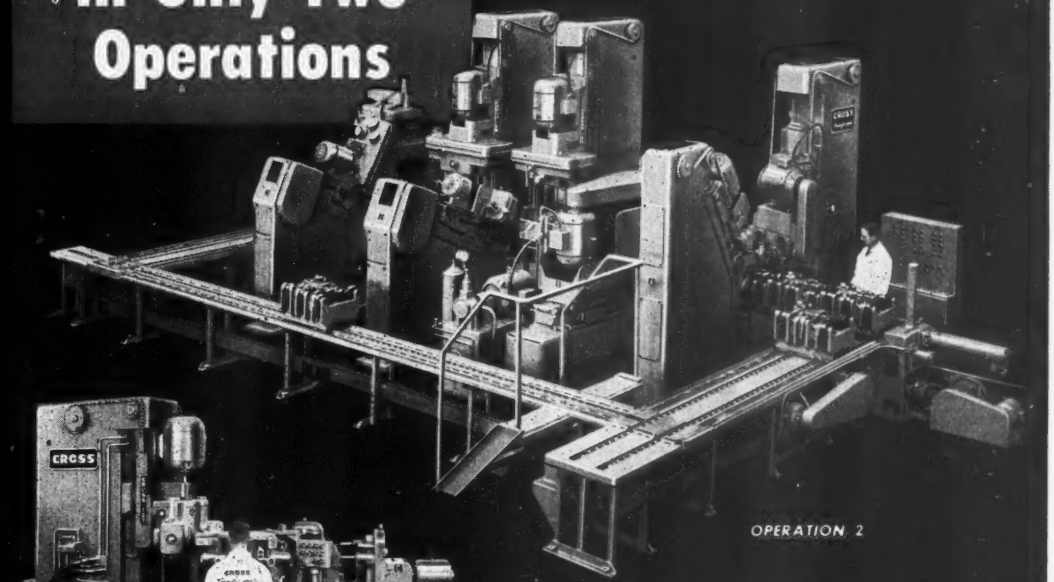
Anton B. Frost, 64, formerly employed by United States Steel Co., South Works, Chicago, and chief roll designer for **Kaiser Steel Corp.** at Fontana, Calif., died Jan. 28.

William H. Oldacre, president and general manager, **D. A. Stuart Oil Co.**, Chicago, died Jan. 18.

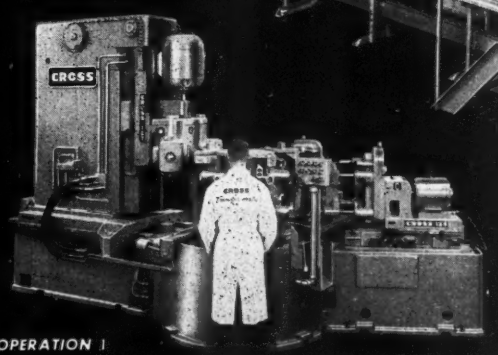
Perry E. Mack, 73, engineer for 33 years with **Briggs & Stratton Corp.**, Milwaukee, died Jan. 26. He retired two years ago.

Intake Manifolds in Only Two Operations

More Specials by Cross



OPERATION 2



OPERATION 1

- ★ **Operation 1: Mill angular mounting pads and drill mounting holes.**
- ★ **Operation 2: Mill choke pad, carburetor pad and water pipe connection; bore water hole and carburetor holes; drill, chamfer, ream and tap all other holes.**
- ★ **50 pieces per hour at 100% efficiency.**
- ★ **J.I.C. standard construction; stranded wire electrical installation; automatic chip disposal; preset tools and Toolometers to reduce downtime and speed tool changes.**

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IF your present products or new products require welding, forming, heat treating or machining, we may be the source you are looking for!

Hundreds of leading manufacturers rely on American Welding for rings, bands and welded products.

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Production AND Engineering NEWS AT A GLANCE

FREES SEALED TUNGSTEN—An ultrasonic vibrator that shakes 27,000 times a second—three times faster than the highest audible range of sound vibrations—salvages tungsten rods sealed in glass in electronic equipment. The vibrator, developed by Raytheon Mfg. Co., shakes glass beads from delicate tungsten rods used in Geiger counters, x-ray and other television equipment. It does the work of ten or more salvagers working by hand methods of hammering the glass seals loose, and saves many times the amounts of scarce metals salvageable by hand. Other critically needed metals such as molybdenum and platinum can be salvaged by this method.

VOLUME HEAT TREATING—By integrating plating and mechanical cleaning operations with heat treating processes a manufacturer of steering assemblies produces 850,000 pounds of parts per month. Work flow involves three critical treatments—carburizing, dry cyaniding and clean hardening, all under controlled atmosphere conditions. p. 82

RESISTANCE THERMOMETERS—Use of resistance thermometers for industrial temperature measurement and control is made practical by a new crossed-coil, cut-pole-face mechanism with high strength Alnico V magnet and low torque spirals. Resistance thermometers, widely used in standardizing work in thermometry and for aircraft temperature measurements have not been used industrially because instruments which combine high sensitivity, and simplicity were not heretofore available. The thermometers have several advantages. They are stable and accurate; and the "end device" may be several hundred feet from the primary detector without affecting accuracy.

$15 MILLION SAVINGS—Standardization of materials handling equipment under the new Air Force packaging and materials handling board will eventually eliminate obsolete fork lifts, cranes, conveyors and similar equipment from military installations. Standardization will cut military inventory of 300 different models of equipment to 70 models, reduce spare parts inventory and simplify repairs. The Air Force alone estimates $15 million annual savings in procurement and spare parts and conservation of manpower through this program.

CONSERVE BY HEAT TREATMENT—Use of boron steels is only one approach to the problem of conservation of alloying elements. At the recent SAE meeting H. B. Knowlton of International Harvester points out that the new 8000 and 8100 series steels without boron have advantages for some applications. Plain carbon steels such as 1045 and 1050, with the help of induction hardening, torch hardening and special heat treatments are valuable for certain applications. Performance tests show that the specially treated carbon steels are equal or superior to the older alloy steels. Study of improved techniques for heat treatment of carbon steels probably offers the greatest possibilities for conservation.

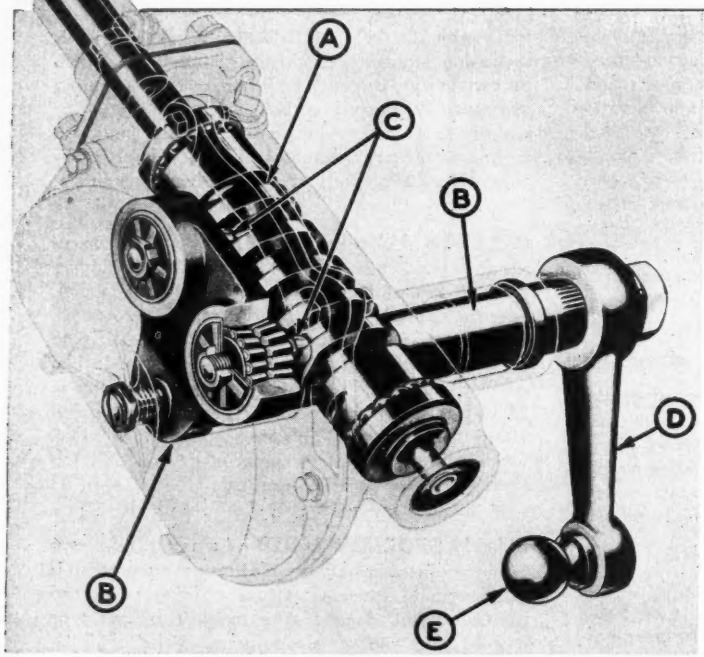
CLEANER ALUMINUM SURFACES—Chemical reactivity of aluminum and the presence of alloying elements make cleaning of aluminum alloys tough. Several cleaning methods and materials, organic, alkali or acid, can be used to do the job. One effective treatment for removing natural oxide film and undesirable constituents consists of a hot etch in 25 per cent sulphuric acid for 5 minutes at about 180°F. This treatment produces good results on all wrought aluminum alloys, especially when it is followed by a dip in 1:1 nitric acid. p. 88

ELECTROFORMED MOLD—Largest article ever produced in nickel by the electroforming process is a giant mold for low-pressure molding reinforced plastic aircraft domes. The mold is a split type 8 x 14 feet with an electroformed nickel shell ¼-inch thick reinforced with steel ribbing welded to the outside surface. Total weight of the completed unit: About 4000 pounds—one third to one fifth the weight of a comparable cast metal mold. The mold was electroformed in two halves over plastic matrices. Shell was electroplated in six or seven days. Bone Engineering Corp., Glendale, Calif., made the mold for Goodyear Aircraft Corp.

MOLECULAR EARTHQUAKES—From the ASM midwinter meeting in Pittsburgh: Melting point of high purity vanadium in raised from 3137° F to 3450° F by alloying vanadium with titanium. Titanium's melting point is about 3300° F . . . Changes in the molecular structure of titanium-chrome combinations can be obtained at lower and less costly temperature ranges by increasing the chromium content. By upping chromium as much as 45 per cent of the alloying material, melting temperature of titanium decreases to 2516°F . . . Brittle behavior of metals at low temperatures, high strain rates and under severe notched conditions is largely strain curable. Some ductility normally lost under service conditions is restored if the metals are prestrained under conditions in which they are ductile; that is in high temperatures, at low strain rates or in compressive mean stress states . . . Aluminum and other metals experience microscopic earthquakes within themselves which lead to separations of their internal molecules. These molecular disturbances largely may be inhibited by alloying aluminum for aircraft with zinc and other metals. For steels, strain hardening is recommended.

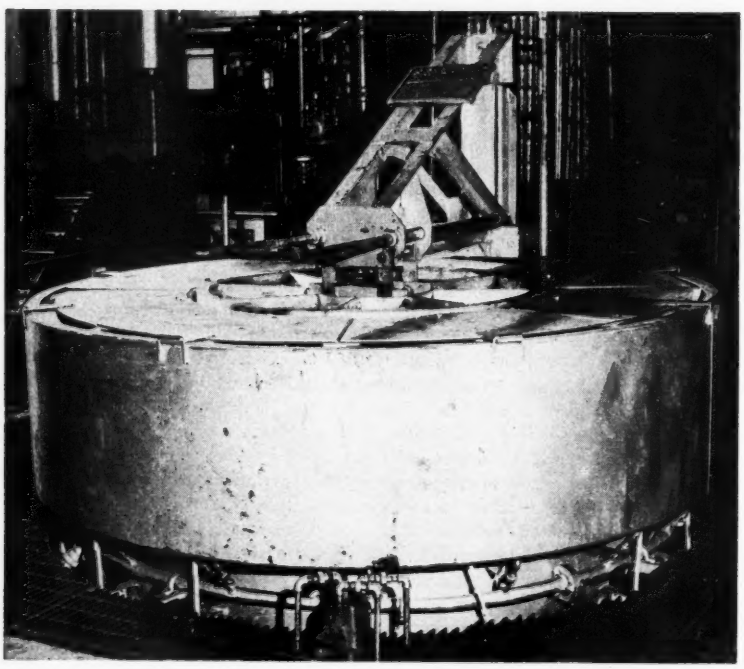
PRODUCTION HEAT T

By GEORGE GOEPFERT
Chief Metallurgist
Ross Gear & Tool Co.
Lafayette, Ind.



Above—Phantom view of Ross cam and roller type steering mechanism. (A) Worm or cam, (B) lever shaft with (C) studs; (D) steering arm with (E) ball

Below—Pit-type radiant tube carburizer for heat treating steering cams



PRODUCTION of over 850,000 pounds of steering assembly parts each month involves volume heat treating under critical conditions imposed by both process and product. All the vital and moving parts are heat treated, undergoing one or more of the three controlled atmosphere processes—carburizing, cyaniding and clean hardening.

Steering assemblies are the cam and lever type. They consist essentially of a worm or cam, lever shaft with studs and steering arm with ball.

Most important single part in this assembly is the worm gear or cam. In this cam it is not the thread but the groove between adjacent threads that is the active element. This groove is tapered to correspond with the cone-shaped studs attached to the lever shaft end. As the steering column turns, the studs follow the grooves and rotate the lever shaft which in turn rotates the steering arm.

To attain maximum strength and long life from these principal parts, the cams are carburized, the studs and ball studs dry cyanided and the steering levers and arms clean hardened. Remainder of the assembly parts undergo one or more of these three principal heat treatments. The heat treated parts are typical of a cam and lever type steering gear assembly.

Heat treat department was developed around a basic plan that utilizes available space and incorporates the best in furnace equipment. A high rate of production is maintained by integrating the plating and mechanical cleaning operations and equipment with the heat treating furnace equipment. Work flow is built around three principal heat treat processes—carburizing, dry cyaniding and clean hardening. These three methods account for practically all of the vital parts in-

TREATING

Processes over 850,000 pounds of steering assembly parts per month

cluded in each complete steering gear assembly.

Gear Gas-Carburized — Cam or worm gear is probably the most critical part of each steering assembly. It absorbs the most punishment and, since it serves to transfer directly rotating motion of the steering column into turning motion at the vehicle wheel, it is really the heart of the mechanism.

These steering cams are generally made from SAE 8620 steel and carburized, in four Surface Combustion radiant tube pit-type controlled atmosphere furnaces. The furnaces are loaded in strings of several cams hung on long rods. These rods are suspended from a special fixture and this fixture, with load, subsequently hung directly under the pit furnace covers. Special lugs attached to the top rim or lip of the furnace heating chamber hold the work fixture and load. Each furnace load contains about 1500 pounds net, depending on the size of cam being treated. Effective internal working dimensions of each pit heating chamber, exclusive of the vertical suspended radiant tubes, is 36 inches in diameter and 48 inches deep.

Previous to this carburizing treatment, each cam is copper plated on one end. By preventing carburization at this point, a subsequent welding operation can be performed to join this cam to the main steering wheel tube. The entire plating operation is carried out in a unique plating department designed and developed by Ross' metallurgical department. This room, located immediately adjacent to the main heat treat room, handles about 80 per cent of all copper and cadmium plating requirements.

RX Atmosphere—After plating, cams are loaded in one of the four pit carburizing furnaces, heated to 1700° F in an enriched RX prepared atmosphere, and held for 7 to 9 hours, depending on size of cam. The load, while still in the furnace, is cooled to 1575° F, held for ½-hour, removed from the furnace and direct quenched in oil. Total cycle will require from 11½ to 14 hours. A minimum hardenable case depth of 0.040-0.060-inch is produced.

Cams are next washed, given a 100 per cent hardness test to a minimum specification of 58 Rockwell C, and then drawn at 325° F for 1 hour. This is followed by a mechanical cleaning and a 100 per cent file test for soft skin. At this point, these worm type steering cams are ready for their final grinding operation.

Fourth pit-type carburizing furnace was recently placed in operation, bringing daily production up to required capacity. Because these furnaces utilize radiant tubes, no muffle is required and maximum charge per load is realized. This results in the handling of more work per square foot of floor space. Special alloy fans are located in the base of each pit to circulate carburizing atmosphere and thus permit uniform heating of the charge and closer control of the temperature. Under continuous operation conditions (1500 pound net loads) each pit furnace requires about 286 cfh of 1000 Btu natural gas during the carburizing cycle at 1700° F.

First pit furnaces were equipped with integrally built RX generators of 250-300 cfh capacity; with the installation of the last pit, two manifolded 2400 cfh RX generators are utilized for all atmosphere requirements including these pit furnaces.

Cyaniding Studs—Studs and ball studs, in actual service, are subjected to considerable frictional wear in addition to impact stress. Studs roll and slide against sidewalls of the roller cam grooves as they move along its length. This motion, transferred along the lever shaft to the steering arm ball in turn causes the ball to slide in a socket on the steering knuckle.

To impart optimum physical properties to the wearing surface of these vital parts, we subject them to a gas cyaniding treatment in a controlled atmosphere continuous articulated link belt furnace.

TABLE I

Process	Carburize	Dry Cyanide		Clean Harden
Parts	Worm Gears SAE-8620	Ball Studs SAE-8620	Studs SAE-8620	Lever Shafts SAE-8645, 1040 Steering Arms SAE-1040, 8645
Heat Treat Cycle	(1500 lb net load) 1. Copper plate end 2. Heat to 1700° F 3. Hold for 7 to 9 hr 4. Furnace cool to 1575° F 5. Hold for ½-hr 6. Quench in oil 7. Draw at 325° F for 1 hr	(250-300 lb/hr) 1. Heat to 1575° F for 1-1½ hr 2. Quench in oil	(250-300 lb/hr) 1. Copper plate 2. Parts previously carburized 3. Heat to 1550-1550° F for 1-1½ hr 4. Quench in oil 5. Draw 325° F 1 hr	(1000 lb/hr) 1. Heat to 1550° F 2. Hold for 15 minutes at temperature 3. Quench 8645 in oil and 1040 in water 4. Draw at 900° F to 1160° F
Results	Hardenable case depth of 0.040 inches.	Case depth 0.010-0.015-inch	Case depth 0.008-inch	

This furnace is equipped with radiant tubes and a magnetic vibrator feeder. This type of feed is well adapted to handling these small studs and balls. Parts are dumped from containers directly onto vibrator pan during the charging operation. Oscillating motion of the vibrator unit prevents the parts from bunching up and feeds them to the cast alloy belt, inside the furnace heating chamber, at a steady rate. Parts are separated enough to insure maximum exposure of each part to the dry cyaniding atmosphere. Production rate of this furnace averages 250-300 pounds per hour.

Quenched in Oil—Steering ball studs, made from SAE-8620 steel, are treated to produce a case of 0.010-0.015-inch deep. To achieve this depth ball studs are heated to 1575° F for 1 to 1½ hours in an RX carrier gas atmosphere, enriched with natural gas and ammonia, and quenched in oil directly from heat. Quenching takes place in a totally enclosed tank arranged so the heated parts drop from the end of the furnace conveyor belt through a chute directly into the oil while still exposed to the enriched furnace atmosphere.

Since air does not contact the parts, the clean bright surface from the cyaniding is retained. As parts settle to the bottom of the 2000 gallon quench tank, they are picked up by an inclined elevator conveyor and transferred out of the tank and into a suitable container. After a subsequent washing operation, to remove quench oil, balls are ready for assembly.

Studs undergo a slightly different heat treat cycle because they have been carburized just previous to this dry cyaniding operation. Studs are carburized to obtain maximum strength and toughness and then selectively dry cyanided on the wearing surfaces for maximum wear and abrasion resistance.

Shank end of each stud is copper plated before the part has been carburized to expose only the wearing surface to the carburizing and dry cyaniding furnace atmospheres. These studs, made from SAE 8620 steel, are cyanided to a case depth of 0.008-inch. They are heated to 1530-1550° F for 1 to 1½ hours and quenched in oil. Parts are then washed and given a draw at 325° F for 1 hour. They are then ready for the final grinding operation before assembly.

Clean Hardening Arms and Shafts—Lever shaft and steering arms are made from SAE 8645 and SAE 1040 steel. These forgings, furnished by vendors, are isothermally annealed and mechanically cleaned. They do not require carburizing but are subjected to a clean hardening treatment.

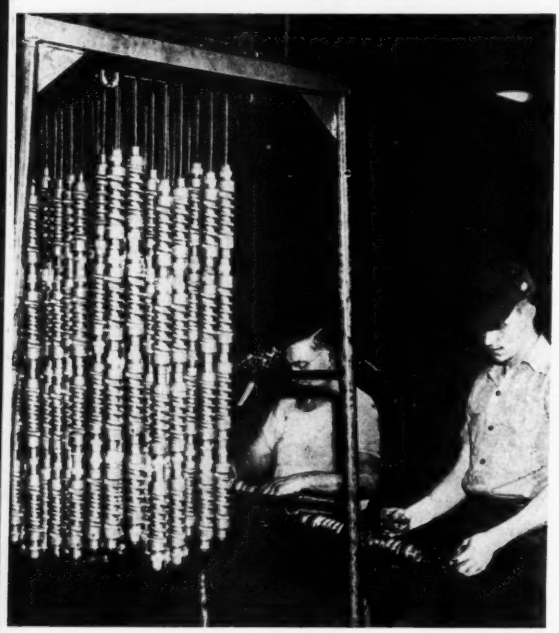
A Surface Combustion rotary hearth furnace equipped with radiant tubes and a controlled protective furnace atmosphere is used. Rotary hearth is ideal for handling the relatively large levers and shafts. Constant speed of the hearth surface insures that each part of the 1000 pounds of parts treated each hour is subjected to exactly the same amount of heat for the same length of time. Only one operator is required for continuous operation of this furnace. The operator merely places the parts on the hearth through the

(*Please turn to Page* 112)

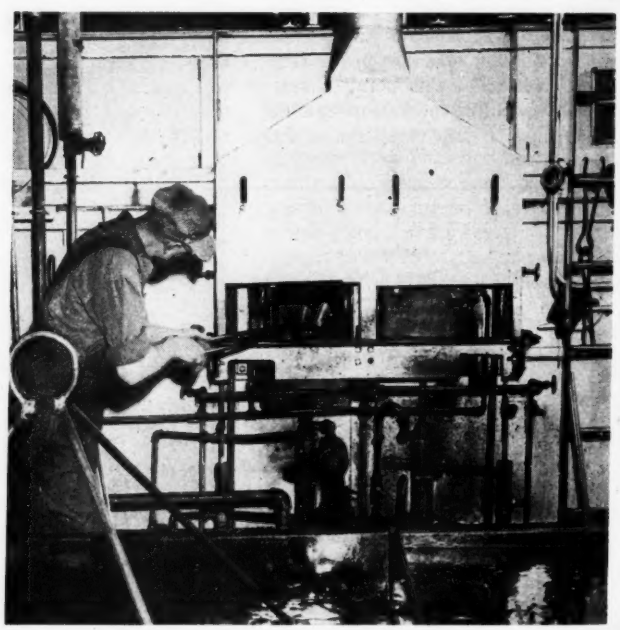
TABLE II

Constituent	Carrier Gas (no additions)	Dry Cyanide (add NH_3 and CH_4)	Carburize (add CH_4)
CO_2	0.0–0.1%	0.0–0.1%	0.0–0.1%
CO	20–21	14–16	14–16
CH_4	0.2–0.5	2–3.5	2–3.5
H_2	37–40	43–46	43–46
Dew Point	+ (10–20°F)	+ (15–25°F)	+ (5–15°F)
Remainder	Nitrogen		

Preparing a pit furnace charge of cams by stringing each part on a long rod suspended from a special fixture



Radiant tube rotary hearth furnace with controlled atmosphere for clean hardening steering arms and levers



Electrode Deposit Fights Wear

Tough, friction-resistant surface is superimposed on worn-down uncoiler cone adapters by applying layers of hard-surfacing welding electrode to extend life by a year

BUILDING up wearing surfaces with hard-surfacing welding electrode, a Pittsburgh steel company rejuvenates uncoiler cone adapters that wear down with unlubricated feeding of steel strip. Electrode used is Lincoln's Toolweld A & O which gives a deposit of 5 per cent chrome tool and die steel. The high tensile deposit is said to extend life of the adapters almost a year. Surface resists wear and tear imposed by 60-inch diameter coils unwinding at 2500 fpm.

About 200 pounds of electrode is required to do the job. After grinding, specifications call for ⅛-inch weld deposit. In applying the friction-resistant surface, 5/32-inch electrode is used, applied in a weaving, slightly uphill motion that builds up overlapping layers of metal approximately 2 inches wide. With this method an entire electrode can be used without pausing for cleaning.

While electrode is deposited, the cone, a 1045 steel casting, is held to a constant temperature of 500° F by a gas burner trained on the underside. Application of this heat prevents cracking of the deposit.

After weld deposit is applied, no heat treating is necessary. The adapters are allowed to cool in still air. Drafts must be avoided since they accelerate the cooling rate.

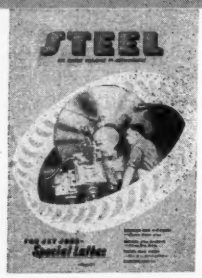
The adapters are welded and ground for the steel company at Acme Fishing Tool Co., Parkersburg, W. Va. Special finish grinding equipment is used.

Right—Building up electrode deposit of 5 per cent chrome tool and die steel. Underside of cone is heated

Above—Finished cone has friction-resistant surface ⅛-inch deep

Left—With electrode application complete, cone is now ready for grinding

Jet Engine Machining Problems Licked



Occupying the center of the ring in the program for providing more muscle for our air arm are the special lathes that will work to the required tolerances and make jet components in quantity

Accurate finishes, convenient operator controls, easy loading and unloading, tracer attachments and constant cutting speed are features of the lathe makers' designs

By ED KARPICK
Associate Editor

CALL it evolution not revolution if you must but you still have to admit that lathe makers have come up with a highly satisfactory solution to the jet engine machining problem. Generally, but not altogether accurately, called T-lathes these machines are a big step toward realizing the nation's production goal of 18,000 jet engines per month.

Lodge & Shipley Co., Cincinnati, is using T-lathe as a trade mark and has an application to register the name pending in Washington. First five machines built by the company were installed at Pratt & Whitney Aircraft (STEEL, Aug. 6, 1951). These lathes are capable of a 60-inch swing and meet P & W's requirement by having "the range of a car wheel lathe with the sensitivity of a toolroom lathe."

By Any Other Name—Right-angle chucking and facing lathe is the designation applied to its product by Monarch Machine Tool Co., Sidney, O. A member of the same machining family as the T-lathe, its roots were formed early in 1950 when Monarch designed and subsequently built a facing lathe to machine metal gaskets for Goetze Gasket & Packing Co., New Brunswick, N. J. Outside diameters of these gaskets are as large as 84 inches and shapes vary widely.

Blueprints of this first design brought a favorable response from aircraft manufacturers, orders were placed and the first machines are already in production making jet engine components. A big upswing in the backlog of tracer-controlled machines forced temporary abandonment of the facing lathe. Demand for the right-angle chucking and facing machine has become so urgent in recent months that Monarch has restored the unit to list of models in production. Several changes in basic design were made to adapt it specifically to the requirements of the jet engine program.

Stubby Unit—A third contribution to faster and more accurate jet machining is the automatic turbine wheel lathe made by R. K. LeBlond Machine Tool Co., Cincinnati. This machine does not have a T-shaped bed and is designed to do a specific job: Automatically profile facing disks or wheels such as are found in GE J-47 or Sapphire jet engine compressor units. Maximum facing diameter with hydraulic traces at 40 degrees is 30 inches and with compound rest at 90 degrees is 38 inches. Both these machines were shown for the first time at LeBlond's plant during the last week in January.

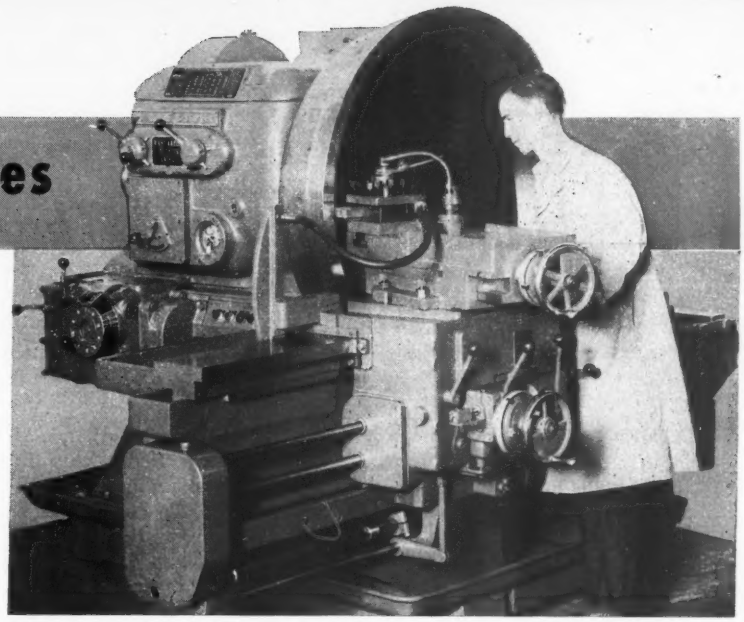
Improvements Continue—Even though the first machines of this broad general type won instant acclaim, machinery designers did not rest on their laurels but continued to refine original machines to customers' requirements. Constant cutting speed and duplicating attachments are features of many machines on order today. Although these features add to the cost, the type of work being done and the advantages inherent in these extras combine to make them a good buy for the jet engine builders.

Six T-lathe models are available from Lodge & Shipley, depending on the type of operations to be performed. Two bed lengths, one or two cross slides, and various combinations of feeds to slides and carriages are included in the line. Some other features are: Independent control of facing and turning feeds in either direction, built-in rapid traverse to carriage operating by light pressure on apron control lever, power angular feed in any direction, electric jog at headstock for changing spindle speeds. The company's Copymatic contouring attachment and a variable speed drive attachment can be included with the various models.

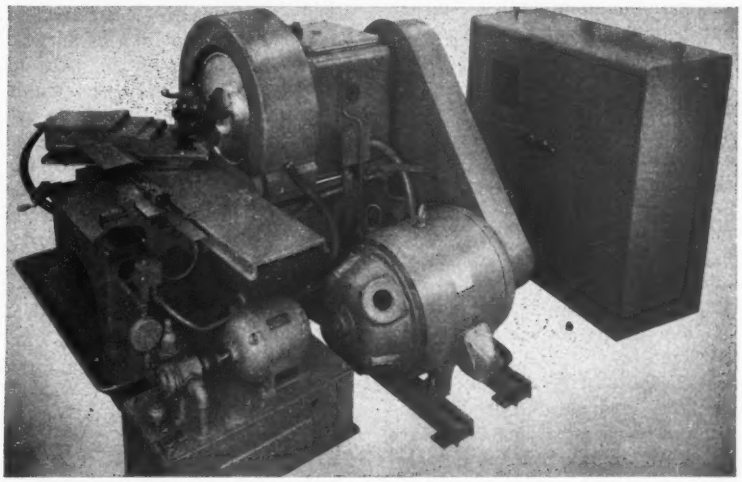
Subcontracting Too—With pool orders for T-lathes totaling about 2200 and pressure being applied to boost jet engine production, Lodge & Shipley has completed arrangements with two subcontractors to step up the flow of machines. Late in 1951 the Machine Division, Vermont Marble Co., Proctor, Vt., shipped the first T-lathe completed under a subcontract from the Cincinnati firm. The contract calls for shipment of eight machines per month in 1952. Basic lathe parts, notably the headstock and feed gearing, are being produced by the prime contractor and shipped to the subcontractors.

Nordberg Mfg. Co., Milwaukee, is the second subcontractor. Starting this month Nordberg will ship ten lathes per month, increasing production to 25 per month by June. Extension of both programs depends on forthcoming demands for defense production. In addi-

ke by Special Lathes



Nearness to the work being machined is one big advantage of Lodge & Shipley's T-lathe design. Reduced scrap losses and less operator fatigue result



LeBlond's automatic turbine wheel lathe proceeds through work cycle without need of operator being in close attendance. Shield protects against coolant spray

Tracer units for control of contouring operations are standard on both models being built by Monarch. A second tracer may be added to right slide if desired

tion Lodge & Shipley will add another 14,000 sq ft of plant area by moving engineering and plant offices to a new administration building just getting underway.

Two Ready — Air Gage tracer units for control of contouring operations on outside or inside diameters or faces from thin metal templates are included on the two models being built by Monarch. The first is a 36-inch and the second a 50-inch swing machine. Designed chiefly for machining jet engine wheels or disks, the smaller unit is equipped with an individually driven, single speed geared headstock driven by a directly coupled motor.

Also individually driven, the feeding unit with power feed to the swiveling compound rest operates over a 90-degree range either forward or back of the center work line and is provided with satisfactory travel to cover 36 inches on both sides of the spindle center. Unit can thus be reversed for facing operations in either direction or rotation of work. Main drive motor is rated at 15 hp.

Constant Cutting — Automatic spindle speed control is synchronized with power feed in either direction at 90 degrees to the spindle covering an 8:1 diameter variation from 32 down to 4 inches while maintaining a fairly constant surface speed. Reversing control operates automatically as the tool passes from one side of the spindle center to the other. Spindle speed control is similarly designed to function on both sides of spindle center. The fpm to rpm ratio is subject to modification to meet individual requirements but such a change is recommended only after careful study since the normal setup gives both a good finish and operating economies.

Second Monarch machine fea-

(*Please turn to Page* 94)

FOR BETTER FINISHES . . .

Clean Aluminum Thoroughly

Several effective methods can be used to clean aluminum and its alloys prior to finishing. Good cleaning practice facilitates other processing

TREATMENT of aluminum alloys to obtain clean, active, smut-free surfaces is made difficult by chemical reactivity of aluminum and by the presence of other metals in the alloy including silicon, copper, manganese, magnesium, chromium, nickel, lead, zinc, and bismuth. These elements not only influence the rate of attack of acid and alkali on aluminum alloys but are left behind on the surface of the metal. If they are not removed they can cause poor adhesion of electrodeposits, organic coatings, and interfere with welding. In addition, aluminum oxidizes rapidly and a thin natural oxide coating is always present on a dry aluminum surface. Thicker oxide coatings may result from heat treating.

Discussing cleaning and etching of aluminum alloys before the 98th meeting of the Electrochemical Society, Dr. Walter R. Meyer, Enthone Inc., points out that, excluding mechanical cleaning, three different types of cleaning materials are used, namely, organic, alkali and acid. While the chemical activity of aluminum assists cleaning when etched surfaces can be tolerated, it limits the type and efficiency of alkali cleaners that must perform without etching. Because of this, solvent cleaners are widely used in aluminum cleaning cycles.

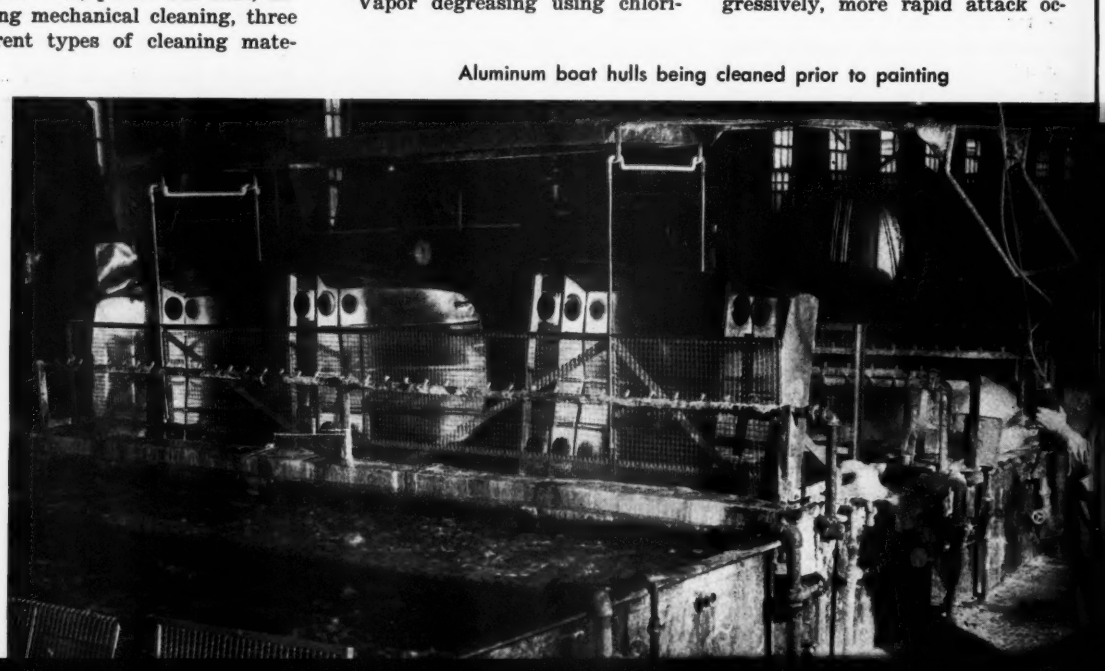
Solvent Preclean—According to Dr. Meyer, if an aluminum surface is heavily contaminated with oil and an etch cleaning operation is to follow, solvent cleaning to remove the heavy oil is a valuable step in preparing the surface for etch cleaning with alkali. If this precleaning is not done, there is danger that a pattern will be developed during etching that cannot be removed readily by subsequent operations. Etch patterns can result from oil being liberated during etching operations from crevices or holes.

Vapor degreasing using chlorinated solvents, such as trichloroethylene, is a satisfactory method for preparing aluminum for many types of finishing operations and for precleaning prior to alkali cleaning in plating cycles. Vapor degreasing reaches hard-to-get-at-places, and leaves parts clean and dry.

Solvent emulsion cleaning is being used with aluminum parts in spray washing machines. A suitable emulsifiable solvent is dispersed in water, in concentrations ranging from 1 to 20 per cent by volume in most cases. There is no appreciable separation of the cleaner from the water phase because of the strong agitation in spray washing machines.

Alkali Cleaners—Alkali cleaners for aluminum Dr. Meyer divides into two types: Etching and nonetching. Aluminum reacts noticeably with solutions at pH's as low as 8 and as the pH increases, progressively, more rapid attack oc-

Aluminum boat hulls being cleaned prior to painting



curs. Due to the rapid rate of dissolution of aluminum, oil and other contaminants are removed by an undermining action, the agitation caused by the evolved hydrogen and the normal cleaning ability of the solution.

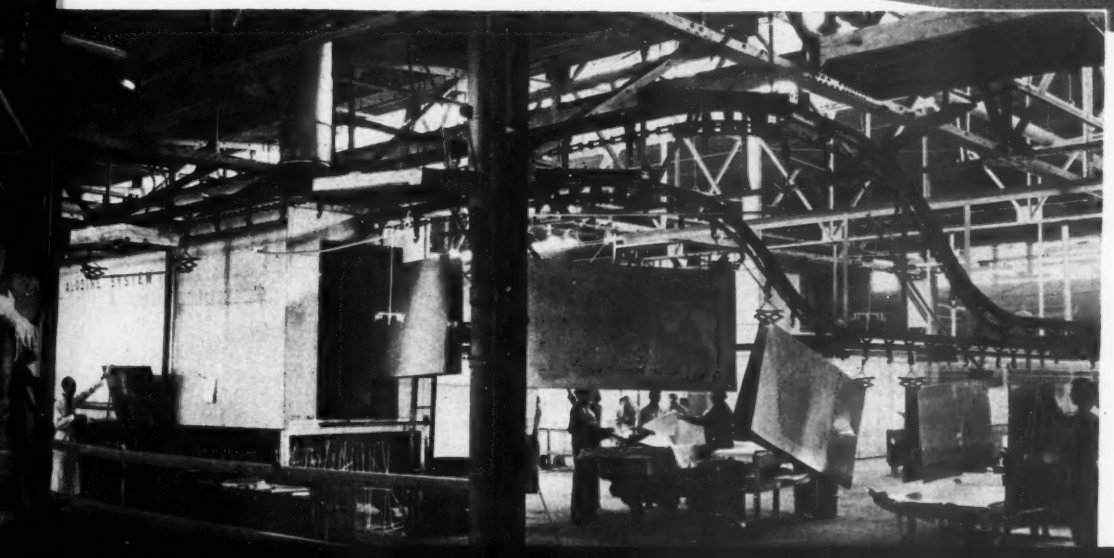
Hot solutions of strong alkalis such as sodium hydroxide, rapidly remove any oxide films that may be present on aluminum surfaces but the surface resulting from the etching operation is not clean even with the high purity commercial alumium alloys. Due to the violent action of hot sodium hydroxide solutions on aluminum, milder alkalis are frequently used for etch cleaning including sodium carbonate and trisodium phosphate. Finer etches are produced with the more strongly alkaline solutions and coarser etched surfaces with the milder alkalis. Certain additives such as sodium fluoride will activate aluminum surfaces when added to alkalis and thereby increase the rate of attack. Sodium carbonate-sodium fluoride solutions are useful for producing frosted etched finishes.

Smut Removal — Removal of smut remaining on the aluminum surface after etching may require special consideration, especially if the alloy contains silicon. All the metals commonly present in the smut will be removed by a combination of nitric and hydrofluoric acids. Ratios of these acids can vary considerably. One mixture that has been recommended is composed of three volumes of concentrated nitric acid and one volume of 48-52 per cent hydrofluoric acid.

Nonetch cleaners contain alkalis such as sodium carbonate, trisodium phosphate, complex phosphates, sodium hydroxide, sodium metasilicate, and wetting agents together with an inhibitor to prevent attack on the aluminum. Inhibitors in this type of cleaner may reduce the overall cleaning efficiency because of film formation. If very oily work is to be cleaned without etching, a suitable precleaning method should be used prior to the nonetch cleaner. Silicates in which the mole ratio of SiO_2 to Na_2O is two to one or greater have been found to be very effective inhibitors of aluminum in alkaline solutions.

Inhibited Cleaners—A number of proprietary cleaning materials of the inhibited-cleaner type are on the market. A concentration of 4-6 ounces per gallon of cleaner is generally used, and solutions are maintained in the range 160-180°F. According to Reynolds Metals Co., these cleaners frequently consist of tetrasodium pyrophosphate with an inhibitor such as sodium metasilicate. Sodium carbonate or trisodium phosphate inhibited with

Right—Overhead monorail equipment and wire baskets are used to move stamped aluminum parts through cleaning cycles at Reynolds Metals Co.



Below—Automatic five-stage cleaning and Alodizing machine for treating aluminum sheets prior to painting. Courtesy American Chemical Paint Co.

sodium disilicate may be used.

All the properly prepared cleaning compounds are free rinsing and are usually formulated to soften hard water so that insoluble film deposits are not formed on the metal. Thus a balanced cleaner for aluminum is composed of definite ingredients for definite functions; these mutually assist each other to provide the most desirable cleaning action.

Acid Cleaning—Phosphoric acid type cleaners are used for cleaning aluminum parts prior to organic finishing. These cleaners may be composed of phosphoric acid together with a material that dislodges oil, such as butyl alcohol, propyl alcohol, or ethylene glycol ethers.

The rate of attack of orthophosphoric acid on aluminum is relatively low. As a result the phosphoric acid removes corrosion products from the surface but does not strongly attack the aluminum surface to produce a smut that would interfere with good adhesion of the organic coating. This type of cleaner is particularly valuable for cleaning large objects that cannot be immersed in the cleaning solution.

Acid cleaners are also marketed under various trade names. This type of cleaner will remove light oxide films, since the solution etches the metal very slightly. Also a thin, inert aluminum phosphate film is probably left on the surface which tends to resist moisture penetration and promote paint adhesion.

SURFACE RESISTANCE MEASUREMENTS ON 2S-H18 ALUMINUM SHEET AFTER VARIOUS PREPLATING TREATMENTS

	Condition of Surface	Surface Resistance Microhms
(I)	(1) After Solvent Cleaning	400–800
	(2) Followed by carbonate-phosphate cleaning	350
	(3) Followed by 25% sulphuric acid etch	23
	(4) Followed by 30-sec dip in 1:1 nitric acid	20
	(5) Plus 1-min zinc immersion preplating dip	4
(II)	(1) After solvent cleaning	400–500
	(2) Followed by carbonate-phosphate cleaning and 30-sec dip in 1:1 nitric acid	15
	(3) Plus 1-min zinc immersion preplating treatment	5

Cleaning for Gating—An effective acid cleaning treatment for removal of the natural oxide film and undesirable constituents consists of a hot etch in 25 per cent (by weight) sulphuric acid for 5 minutes at about 180°F. This treatment produces uniformly good results on all wrought aluminum alloys especially when it is followed by a dip in 1:1 nitric acid. In studies conducted by Keller and Zelley of the Aluminum Co. of America, electrical measurements of surface resistance were used to provide a convenient means for determining effectiveness of different cleaning and oxide removal treatments.

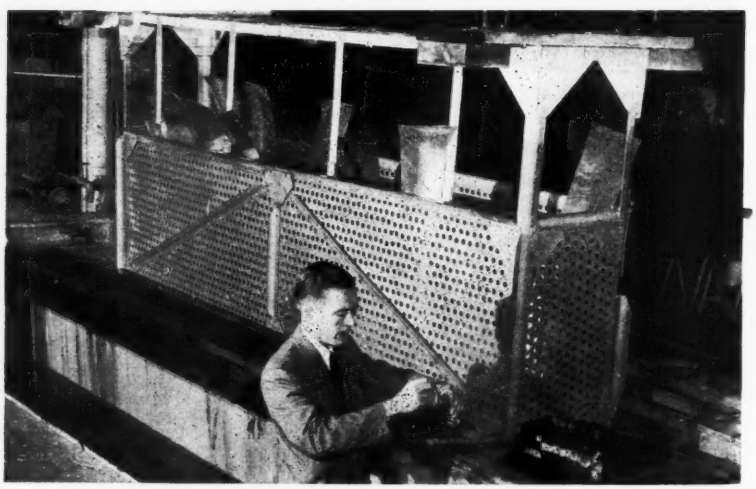
Typical results of these measurements are summarized in the accompanying table. Surface resistance measurements were made by Kelvin Bridge using 0.25-sq in. contacts and 1000-pound pressure. Measurements were made within 5 minutes after each treatment. There is a "blank" resistance of about 2 microhms included in the determined values.

Cleaning Prior to Spot Welding—To produce quality welds of the desired strength surface of aluminum and its alloys should have uniformly low resistance. Proper surface preparation usually requires two operations. The first is the removal of oil, grease, dirt, marking ink, forming compounds, etc. The second is the removal of the nonuniform oxide film. Cleaning methods previously described will remove the soil. Oxide film must be removed mechanically or by chemical solutions.

For this purpose, Reynolds Metals Co. suggests a solution consisting of 9 ounces per gallon phosphoric acid and 2¾ ounces per gallon of chromic acid. Also, a hydrofluoric acid (1 per cent) immersion method is efficient. Parts are dipped in the acid solution for 15-30 seconds and then rinsed thoroughly. The sodium acid sulphate type of etching solution is advantageous for production systems because of economy, noncritical timing and freedom from objectional fumes.

Oakite Products Inc., reports that aluminum being treated for spot welding should go immediately from the rinse tank, after cleaning, into the deoxidizing solution. For oxide removal use of 10-12 ounces per gallon of Oakite compound No. 34 at room temperature produces satisfactory results. If noncopper bearing or clad alloys are being deoxidized, Oakite compound No. 84-A, at 4 to 6 ounces per gallon, temperature of approximately 180°F is satisfactory for oxide removal.

Usually a 3 to 10 minute soaking period is sufficient for thorough deoxidizing. Time of immersion depends on the amount of oxide being removed and on the



Deoxidizing Alclad aluminum at Lockheed Aircraft Corp. before spot welding. The steel processing tank is protected by an acid proof brick lining. It is heated with a carbon electric unit. Courtesy Oakite Products Inc., New York

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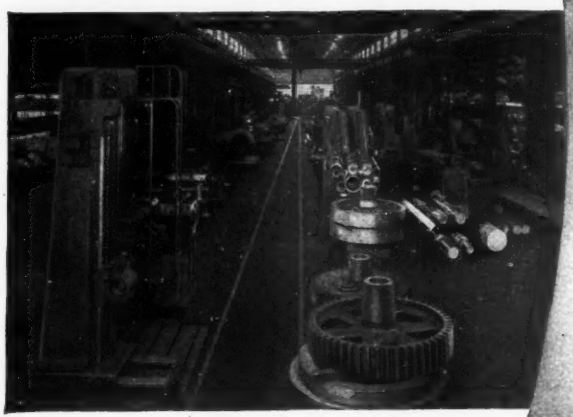
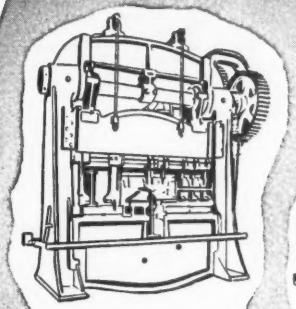
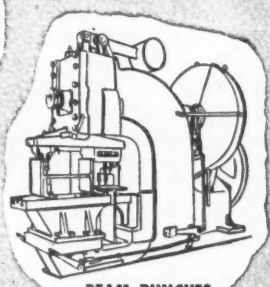
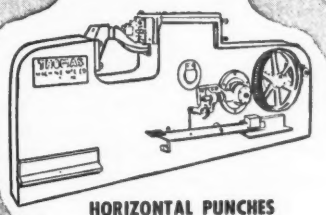




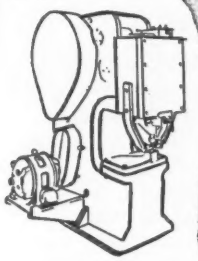
MULTIPLE PUNCHES



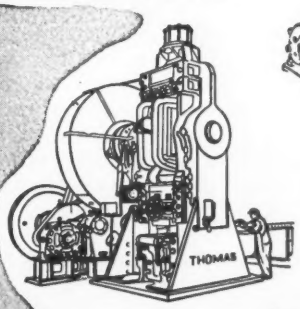
BEAM PUNCHES



HORIZONTAL PUNCHES



VERTICAL PUNCHES



BILLET SHEARS
8" x 8"

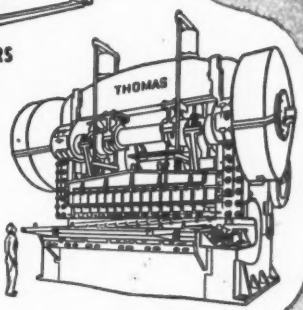
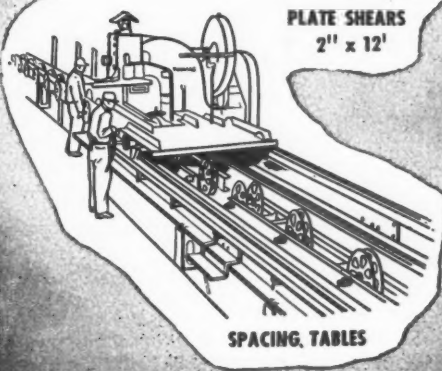


PLATE SHEARS
2" x 12'



SPACING TABLES

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alloy and gage of the aluminum. Lighter gages may require a shorter immersion time than is needed for heavier gages. After deoxidizing, the aluminum should be thoroughly rinsed and dried. Clean, dry, filtered air from a blower, or warm air in a drying booth are useful for this purpose.

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Electronic Rubber Adds Product

Electronic Rubber Co., Stamford, Conn., says it is expanding facilities to include manufacture of polyvinyl chloride injection molding and extrusion compounds for nonelectrical uses. The company has been active in developing high-temperature performance vinyl compounds for wire insulation. A major factor in its work has been ability to control closely the quality of compounds through development and use of slow compression, heat deformation and air oven aging tests.

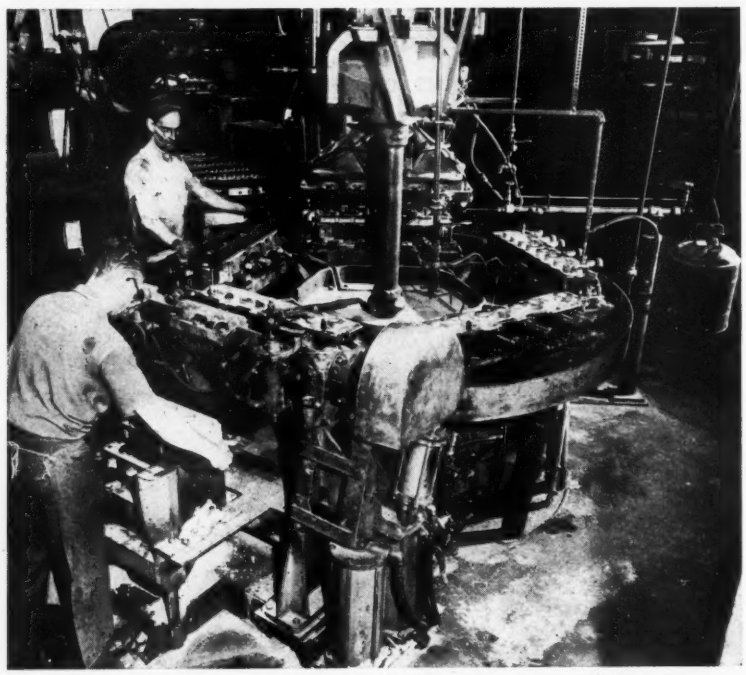
Cores for Automotive Castings Produced 600 Per Cent Faster

PRODUCTION increases of over 600 per cent are reported by automotive foundries from a new automatic method for making cores. This method utilizes the Roto-Core automatic, a new machine designed and manufactured by Osborn Mfg. Co.'s Machine Division.

The machine combines three main jobs in coremaking: (1) Blowing the core, or driving prepared sand into conventional core boxes; (2) bringing empty core boxes to the core blower for filling and taking away filled boxes; (3) extracting cores from filled boxes onto dryer plates ready for processing.

Under the old system of making cores for automotive castings, approximately 30 block jacket cores were turned out by a coremaker in 1 hour. Utilizing this new method, a worker can turn out 180 accurate, high-quality cores per hour. The two workers required to man the machine can be taught to run it in a short time.

In the art of coremaking, it is desirable to have as many operations as possible performed mechanically. Under the old method, one worker operated the core blower, another carried core boxes to the blower, while the third would draw the core and place it on a conveyor to the baking ovens. Thus a three man team was needed to produce 90 cores per hour, or a production rate of 30 cores per man-hour. The Osborn method turns out 360 jacket cores an hour—with a two-man team.



Buick Division of General Motors is using this automatic coremaking machine to produce cores for intake manifold, block water jacket and spring housing for the cylinder block. Several accessories added by Buick have speeded up production from original estimated 240 cores per hour to more than 300

Because this automatic machine combines several operations, considerable space will be saved in the core room.

Machine consists of a turntable with five stations: One for the blow; one where the worker places the dryer plate on the finished core; the rollover, where the core is taken from the core box and placed on a conveyor; another where the core box is blown and sprayed; and the last, where loose pieces are placed in location automatically for the next cycle.

Core boxes are mounted on removable platens for quick changes to make various cores. Air pressure in the blower is the same as it is in manually-operated core blowers (125 psi).

This development was started at the Cleveland company in spring of 1950 at the request of General Motors' Buick Division. Osborn at that time had a machine utilizing the turntable principle estimated at a capacity of approximately 166 per cent more than was being obtained then.

In June 1951, one year later, the first machine, now perfected to turn out over 240 cores per hour was shipped to Buick. Accessories added by Buick to the equipment have since speeded up production.

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CONCLUDED FROM PAGE 87

JET ENGINE MACHINING PROBLEMS LICKED

tures a 16-speed, helical-geared headstock designed for individual motor drive with the motor mounted atop the headstock and driving accomplished by multiple V belts. Right angle feeding unit has two power angular feed slides, the one at the left of spindle center has an air tracer attachment and the other to the right can have power angular feed or an auxiliary tracing unit. An Air Gage tracer slide is located on the left unit.

For contour facing operations, a right angle power feed serves each feeding unit and a 3:1 dc motor varies the spindle revolutions so that a more constant surface cutting speed may be obtanied. Manual control is used as the two slides, in production practice, will invariably be working on different diameters and will seldom, if ever, be changing diameters in the same relationship. Where one slide is applied to the facing operation and the second used on angular feed for light forming, the rheostat control for the motor may be actuated by the right angle feed of the left unit only.

Auto Wheel Turning — Carriage on LeBlond's turbine wheel lathe is a simple bridge across the abbreviated bed carrying a cross slide on which various tool slides may be mounted. Two headstocks are offered—the high speed head for aluminum disks at the cold end of the engine and another for stainless steel or titanium disks. They can be reversing or nonreversing and equipped with either manual or automatic controls.

On the automatic version the LeBlond Hydra-Trace mounted on the cross slide is an integral part of the design. Angle of the tracer slide is adjustable to meet the various conditions encountered in profile facing. If pressure in the hydraulic system falls below 100 psi, a safety valve shuts off the machine.

Operating angle of the top slide together with tool limitations often make it impossible to complete the required profile in one pass from periphery to center in the conventional manner. The across center technique overcomes this difficulty by machining outside shoulders when feeding from front to center and inside shoulders when feeding from center to rear. This requires reversing the spindle when tool reaches center. To maintain direction of the cross slide, feed drive must also be reversed when reversing the spindle. These operations plus tool retraction and rapid traverse are done automatically. Trip-dogs actuate limit switches to setup and adjust the cycle.

Easy Job—Once work is loaded into the machine, operator only has to engage the tracer control lever and push the start button. Angular approach to work is by a combination of the movement of the tracer slide and rapid traverse of the cross slide. On nearing the work, rapid traverse is converted to a constant feed and the Hydra-Trace controls the tool to end of cut. At the end of the cut both the tracer and cross slide are automatically returned to their starting position by rapid traverse.

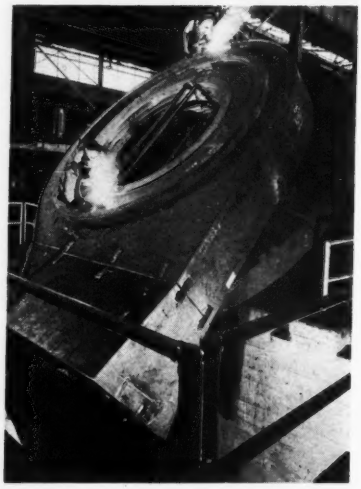
Spindle speed is varied by a flat cam actuating a reactor that controls the variable speed unit to approach constant cutting speed. This cam may be modified or replaced to suit required conditions.

Operator Missing — Absense of an operator in the photograph of the LeBlond machine going through its cycle, illustrates its automaticity. Tool begins its cut on a 16-inch diameter at 208 rpm, resulting in 870 surface feet per minute. This surface speed is maintained by variable speed control until a maximum of 550 rpm is reached at a 6-inch diameter. Spindle speed stays constant across the center until the tool reaches a point 3 inches beyond center and deceleration begins. At the end of cut tool is working on a 23-inch diameter and spindle speed is down to 145 rpm. When using a feed of 0.0120-inch, cycle time exclusive of loading is 4 minutes 50 seconds.

Contour of some disks is such that the tracer used in the foregoing operation is not applicable. Then a two directional tracer which hydraulic controls feed in both directions is offered. The machine can be furnished with a power angular feed compound rest instead of the Hydra-Trace, in which case manual controls are furnished in place of the automatic cycle. This can be used when turning and facing rings not requiring contouring.

Although all current output of these special machines is headed for jet engine building plants, other manufacturers are interested in using them for a variety of operations. All three lathe builders expect their current machines with certain modifications are here to stay. The current volume undoubtedly will not be maintained but the same is true of other machine tools. Where single manufacturers are now ordering a number of machines, the orders of the hoped for peacetime economy will call for one or two at most. Advantages inherent in these machine like: Ease of loading and unloading, ease of gaging, smaller floor space requirements and convenience for operator will keep them in metalworking plants.

Positioning Table Aids Welding



WELDING center section of the low-pressure cylinder for a steam turbine generator is speeded by use of a special table at Allis Chalmers Mfg. Co., Milwaukee. The 50-ton motorized positioning table can be adjusted from the horizontal to a 90-degree angle to rotate a piece nearly 27 feet in diameter at speeds ranging from 8 inches to 20 fpm table rim speed

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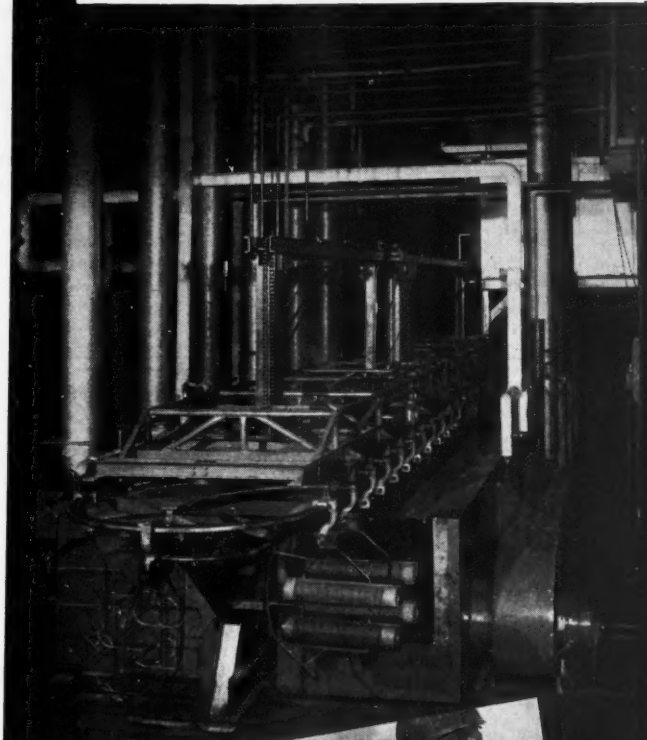
WITH
MASS PRODUCTION



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Udylite
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DETROIT 11, MICHIGAN

Lee Wilson

ANNEALING FURNACE DATA SHEET

NUMBER ONE

BASIC ADVANTAGES OF LEE WI SINGLE-STACK PORTABLE BA FURNACES:

1 BETTER QUALITY
2 HIGHER PRODUCTION
3 LOWER FUEL COSTS
4 LOWER FIRST CO
5 LOWER MAINTE
6 LOW HANDLING

SINGLE-STACK PORTABLE BASE FURNACE IMPROVES PRODUCT QUALITY..

Basic design permits Single-Stack Portable Base furnaces to do a job of annealing unsurpassed by any other method. The surfaces of coils in larger multiple-stack furnaces are necessarily at varying distances from the heat source. Tube radiation is limited to but two sides of the charge whether the tubes are along the walls or across the furnace between the coils. (See Figures 1 and 2.)

MORE UNIFORM HEATING AND COOLING

An ideal situation is to have the heat source a uniform distance from the entire surface of the charge, which permits twice as much radiating area. (See Fig. 3.) This arrangement, of course, is only practical in a Single-Stack Portable Base furnace.

CONTROLLED ANNEALING

Too, the Single-Stack Portable Base furnace comes nearest to complete regulation because each furnace is equipped with individual controls. Temperatures and cycles are automatically regulated to meet almost the exact requirements of each charge — resulting in a heating and cooling uniformity unmatched by any other type furnace.

Too, by grouping coils of approximately the same widths and lengths — a comparatively simple operation when using Single-Stack Portable Base furnaces — an even greater measure of control is attainable.

For complete information send for fully illustrated 20-page booklet.

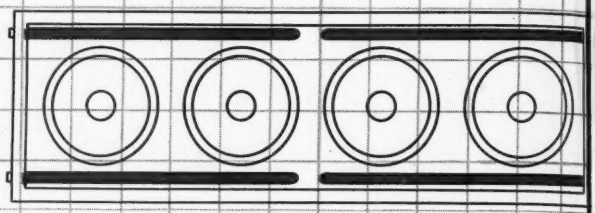

Fig. 1 — In large multiple-stack furnaces there is no practical method for applying balanced heat. The surface of the charge is necessarily at varying distances from the heat source.

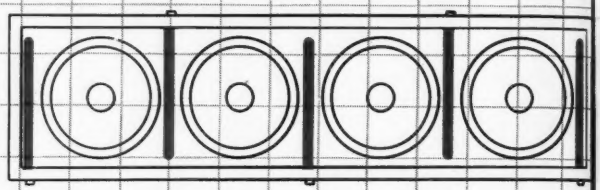

Fig. 2 — Tube radiation is limited to but two sides of the coils whether they are placed along the furnace walls or crosswise between the coils.

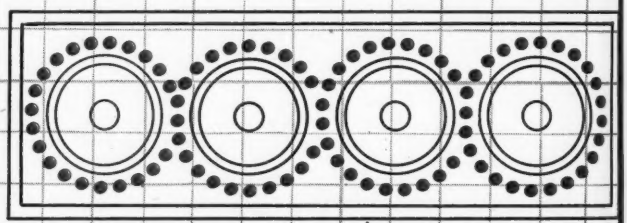

Fig. 3 — This multiple-furnace arrangement would be ideal if it were possible to build.

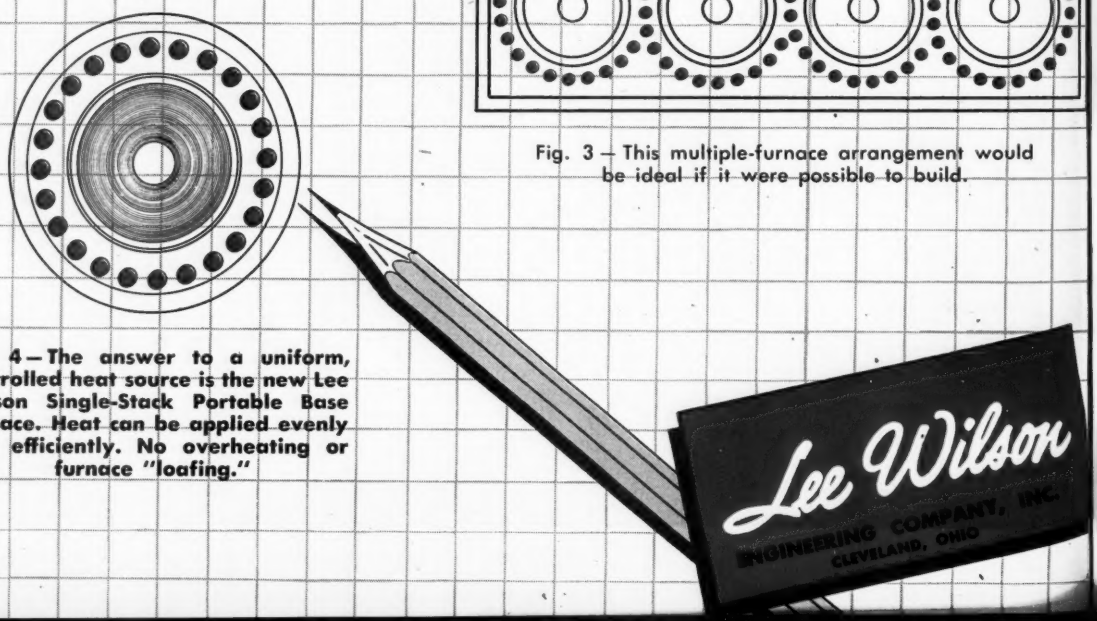

Fig. 4 — The answer to a uniform, controlled heat source is the new Lee Wilson Single-Stack Portable Base furnace. Heat can be applied evenly and efficiently. No overheating or furnace "loafing."

OTHER articles in this series appeared in these issues of STEEL:

I—Operating Theories, Dec. 10, 1951, page 102
II—Thermal Requirements of Shaft, Dec. 24, 1951, page 66
III—Hearth and Bosh Reactions, Dec. 31, 1951, page 62
IV—Influence of Coke Ash on Thermal Effects, Feb. 4, 1952, page 98

Blast Furnace Practice • • •

V—Comparison of Operating Data

Advantages to be gained by classifying slags by tetrahedrons are explained clearly in the accompanying article. Uniform slag-constituent ratios indicate uniform chemical composition of burden components; uniform tetrahedron arrangement indicates the uniform movement of stock through the furnace

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

ACTUAL furnace practice data are offered as a complement to the discussion of operating theories presented in Part III (STEEL, Dec. 31, 1951) with particular emphasis being placed upon the influence of slag-mineral composition on thermal conditions within the furnace, and advantage of tetrahedron method of slag classification for determining that influence.

Practice data shown are monthly averages used for accounting purposes at the plant where they were compiled. During the four years of furnace practice comparisons the plant produced basic, bessemer, malleable, foundry and intermediate low-phosphorus irons, necessitating frequent changes in burden.

Table III illustrates the method used for classifying slag by tetrahedron. The four principal constituents of daily average slag analysis are first converted to the 100 per cent composition from which the tetrahedron for the day is determined by applying the analysis to the McCaffery diagram. At the end of the month daily classifications are summarized in percentage of days when the respective tetrahedrons occurred.

Involves Many Analyses—Slag classifications in Table IV represent about 1450 daily analyses and show average monthly data for four years operation of the stack on Lake ores. Use of monthly average figures and the number of months covered eliminates distraction of daily fluctuations in operating conditions and consequently permits reliable comparison between actual practice data and the theoretical discussion presented in former installments. A summary of monthly tetrahedron classifications is arranged in Table IV in the order of their thermal effects as indicated by theoretical study, with tetrahedron No. 6 being first on the acid and tetrahedron No. 8 first on the basic side of neutral.

April, the blow-in month for the 1942 campaign, has the highest percentage of basic tetrahedrons and the largest flue dust production even though the blowing rate was the lowest for the year, again substantiating the effect of thermal conditions in the furnace shaft due to high temperature in the upper bosh.

Discounting April, slags in tetrahedrons Nos. 7, 8 and 14 were 39.59 per cent of the time from May to November. Slag weights per ton of iron are comparable for the first seven months of 1942, with a decrease in the last two months. Decrease in slag weight is complementary with a decrease in basicity, and the effect of changed mineral composition of slag is reflected in practice data.

Attention is called to the variable percentages of tetrahedron No. 5. Percentages of alumina and magnesia taken together are always important factors in determining tetrahedron classification, and consequently in determining the thermal effect of slag on furnace operation. Theoretically, tetrahedron No. 5 tapping slag is not favorable to conservation of heat in the lower bosh and such a condition tends toward low ratio of burden to fuel.

1. Months which have the highest percentages of tetrahedron No. 5 slags were low in burden ratio compared to other months.
2. Months in which tetrahedron No. 5 appears in appreciable percentages do not have as good furnace practice as months where it does not exist.

Calcite stone was substituted November 10 for the partial dolomitic stone. For the first ten days of the month the slag was consistently in tetrahedron No. 7, and this period accounts for most of the basicity in November. Throughout the month attempt was made to blow 64,000 cfm of air. For the first 15 days stock movement and

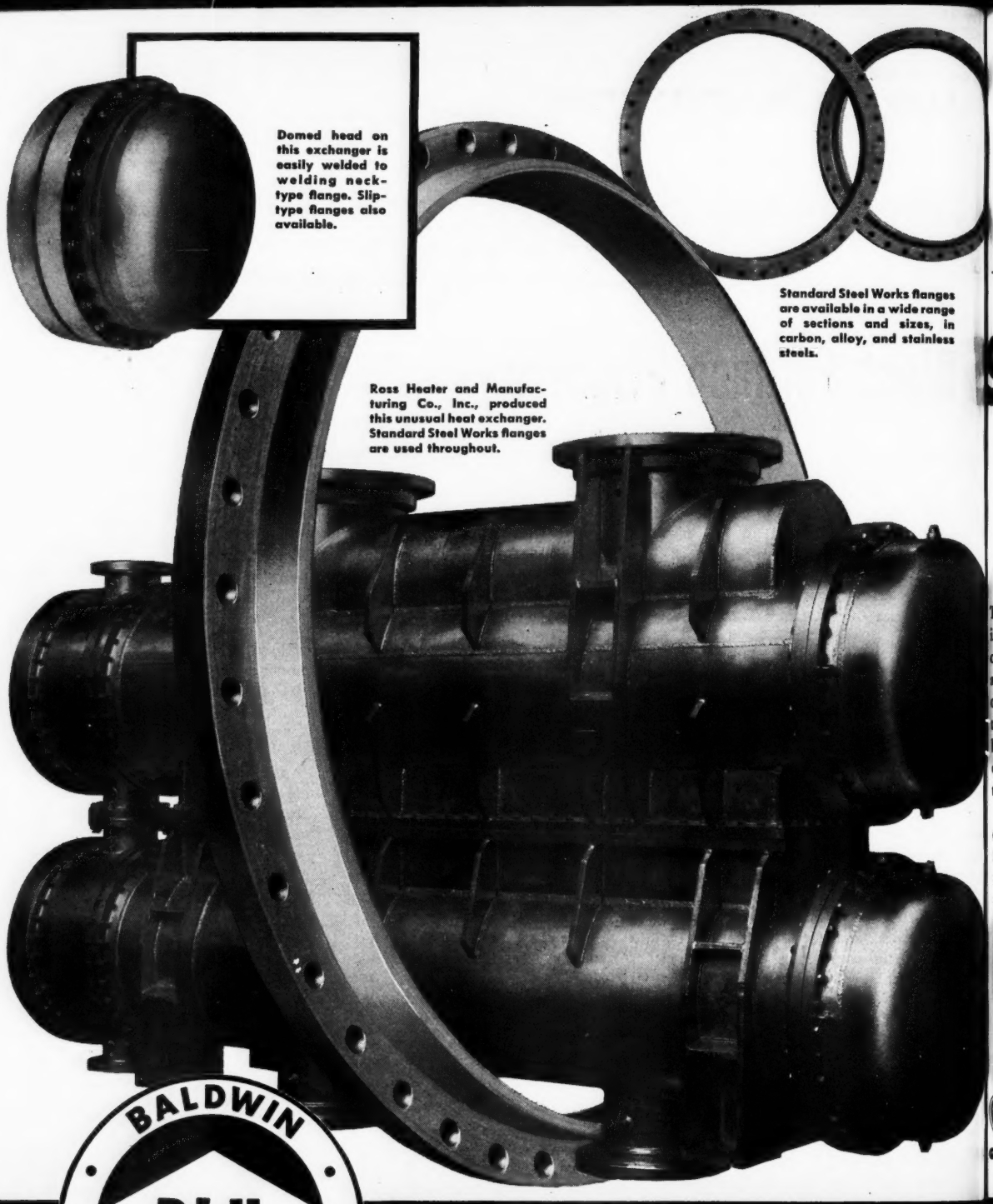

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TABLE III

SLAGS CLASSIFIED BY TETRAHEDRON FOR MARCH, 1945

Date	Laboratory Analyses, Per cent SiO_2	Al_2O_3	CaO	MgO	100% Oxides, Per cent SiO_2	Al_2O_3	CaO	MgO	Viscosity @ 1500°C in poises*	Tetrahedron No.
1	34.32	14.98	43.28	5.59	34.95	15.25	44.08	5.69	3	6
2	34.14	15.34	45.12	3.38	34.84	15.65	46.05	3.45	3	6
3	34.98	15.15	44.04	3.36	35.86	15.53	45.15	3.44	4	6
4	33.34	14.88	45.38	4.76	33.99	15.14	46.13	4.83	4	6
5	34.56	14.96	42.56	5.93	35.26	15.26	43.42	6.05	4	6
6	36.10	15.12	40.83	5.61	36.96	15.48	41.80	5.74	5	2
7	35.80	14.86	42.78	4.35	36.61	15.19	43.76	4.44	4	6
8	34.94	15.30	42.87	4.87	35.66	15.61	43.75	4.91	4	6
9	34.92	15.28	44.62	3.28	35.59	15.57	45.48	3.34	4	6
10	33.88	16.28	43.21	4.60	34.44	16.62	44.13	4.69	4	6
11	33.80	16.62	45.49	2.34	34.40	16.91	46.30	2.33	4	6
12	34.30	15.90	44.19	3.61	35.00	16.22	45.09	3.68	4	6
13	35.88	16.34	42.56	2.98	36.70	16.71	43.53	3.05	5	2
14	35.92	16.16	40.94	4.81	36.71	16.51	41.84	4.90	4	6
15	36.18	16.24	41.48	3.72	37.06	16.63	42.49	3.81	5	2
16	36.70	15.70	40.72	4.47	37.60	16.09	41.72	4.58	6	2
17	33.90	15.86	43.13	5.23	34.54	16.16	43.95	5.33	4	6
18	34.36	15.70	39.74	7.97	35.14	16.05	40.64	8.15	4	2
19	35.52	16.40	41.28	4.78	36.26	16.74	42.13	4.87	4	6
20	33.78	16.26	40.40	6.37	34.89	16.79	41.73	6.57	4	6
21	34.22	16.74	41.50	2.14	36.17	17.69	43.86	2.25	5	6
22	34.30	16.04	41.17	6.26	35.08	16.40	42.10	6.40	4	6
23	34.84	16.44	41.75	4.81	35.60	16.80	42.67	4.94	4	6
24	35.30	15.92	40.98	5.52	36.12	16.28	41.93	5.64	5	2
25	36.08	15.90	40.66	4.79	37.03	16.31	41.73	4.91	5	2
26	34.32	16.36	41.42	5.75	35.07	16.71	42.33	5.87	4	6
27	35.20	15.80	40.55	6.25	35.99	16.15	41.48	6.38	4	2
28	35.12	16.50	40.55	5.77	35.85	16.84	41.40	5.89	5	2
29	35.54	15.42	40.44	6.37	36.35	15.77	41.36	6.51	5	2
30	36.20	15.58	39.35	6.63	37.02	15.93	40.24	6.78	5	2
31	36.70	15.70	39.46	5.45	37.71	16.13	40.55	5.59	6	2
Ave.	35.00	15.81	42.01	4.90						

	Occurred, Days	Per cent
Tetrahedron No.:		
2	12	38.70
6	19	61.29
	31	99.99
Viscosity No. in poises:		
3	2	6.45
4	18	58.06
5	9	29.03
6	2	6.45
	31	99.99

* A poise is a unit 100 times greater than water at 20° C.

blast pressure were most irregular but more regular from then on.

Lower Temperature Expected—Radical change in the slag-mineral composition is indicated by the large increase in percentage of tetrahedron No. 6 classification for November and December compared to other months of 1942. With the existing conditions lower blast temperature for November would logically be expected; that it did not occur is probably due to a drainage of heat from the bosh by the faster blowing rate. As blast volume decreased 5.64 per cent from November to December, iron output declined 5.94 per cent.

October with lowest percentage of tetrahedron No. 6 for the year, indicating minimum "available hearth heat," had the highest blast temperature and lowest burden ratio for the year.

Silicon content in iron for 1943 was comparable to 1942, with some variation in the amount of scrap used. Coke ash was approximately 0.75 per cent higher than in 1942. Burden ratio and iron production show increases, with decreases in blast temperature, fuel rate, and slag weight.

During 1943, from April to December inclusive, frequent attempts were made to blow from 62,000 to 65,000 cfm of air. Despite irregularities from overblowing overall results were better than in 1942.

1. Uniform chemical composition of raw materials is indicated by uniform ratios to each other of chemical constitutents in the tapping slag.

2. Uniform furnace operation is indicated by uniform classification of tapping slag.

Greater uniformity of the slag-mineral composition as indicated by the range in tetrahedron classification from November 1942 to September 1944, was caused from substitution of calcite stone for partial dolomitic stone used before and after these dates. Theoretical study of slag-thermal effects indicates tetrahedron No. 6 (Planes 4.00 to 6.00 per cent magnesia) tapping slag will conserve heat in the bosh better than any other composition. Such condition must have prevailed in 1943. A comparison of thermal and mechanical conditions in the furnace shaft for 1943 with the same conditions and irregular slag composition of 1942 indicates that the blowing rate of 1943 would have been impossible with 1942 conditions.

Perfect Balance Indicated—The blowing rate for March 1943 was 61,473 cfm which afforded the heaviest burden, the largest production of iron, the lowest fuel rate and the lowest blast temperature for the year, indicating the approach to a perfect balance between shaft work and bosh and hearth work. Thermal influence of slag is indicated by tetrahedron classification and by daily chemical analyses in Table III.

Uniform slag-constitutent ratios indicate uniform chemical composition of burden materials; uniform tetrahedron classification indicates uniform passage of burden materials through the furnace. Daily slag analyses when classified by tetrahedron are in Nos. 6 and 2. Theoretical study of slag-thermal effects indicates tetrahedrons Nos. 6 and 2 in the order named, are preferred for tapping slag.

The heavy burden carried in relation to the amount of flue dust produced indicates that shaft operation prepared stock is available for smelting to the limit of shaft capacity, with the class of iron bearing materials used (Lake ores). Low blast temperature indicates that with the ideal mineral composition of slag, the maximum amount of hearth heat was available for work on material delivered from the shaft; consequently, low blast temperature was adequate to maintain a thermal balance between shaft work and bosh and hearth work. More burden, or more blast, would have thrown shaft operations out of balance with bosh and hearth operation as would higher blast temperature, or less desirable mineral composition of slag. Conditions thus appear to be a perfect demonstration of Johnson's 2-thermal equation theory.

If iron-bearing materials such as volatile-free sinter, had been available which do not require as much preparation for smelting as natural Lake ores, they could have been substituted for soft ore in various percentages, each of which would have created new critical conditions of thermal balance between shaft work and bosh and hearth work. Any increased weight of bur-

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den material then delivered to the bosh and hearth could have used more blast heat until a new balance was created between shaft work and bosh and hearth work, with a benefit to both iron production and the fuel rate. In short, the critical balance between shaft work and bosh and hearth work varies with relation to each other of the several factors cited.

Required More Coke—Practice for May shows burden ratios, flue dust production, iron production, and slag composition, comparable to March. Slag analyses for the two months are comparable in tetrahedron classification but May was not as uniform in slag constituent ratios as March. This and irregular operating conditions caused by attempted blowing rates (64,000 to 65,000 cfm) resulted in the consumption of 52 pounds more coke per ton of iron than in March.

Advantage of uniform mineral composition in slag has been stressed but without uniform ratios in slag-forming constituents in raw materials, uniform mineral composition in slag is impossible. Daily slag analyses from June 1943 through 1944 and 1945 had a range in constitutent percentages as follows;

Compound	Per Cent
SiO_2	29.00-38.00
Al_2O_3	13.00-23.00
CaO	32.00-50.00
MgO	0.17-10.00

Obviously, with such range in constituent contents many variations in slag mineral compositions were inevitable. The noticeable increase in alumina content for 1943-44-45 in relation to magnesia content for the same period is definitely reflected in the practice data. When silica/alumina ratio in burden materials was lowered in 1943 the change had a minimum ill-effect on thermal reaction in furnace operation because the use of calcite stone decreased the magnesia content in the slag proportionately to the increase in alumina, and the ratio of the two to silica and lime permitted a slag of tetrahedron No. 6 composition and within the preferred silica-lime/alumina-magnesia ratio a large part of the time. This condition prevailed until September 1944 when fluxing stone was changed from calcite to partial dolomitic stone. Since silica/alumina ratio in the ore mix was not changed the increased and variable percentage of magnesia in the stone created constituent ratios which destroyed the preferred silica-lime/alumina-magnesia ratio and the

TABLE IV

MONTHLY REPORT OF STACK COVERING A 4-YEAR OPERATION ON LAKE ORES

	Tetrahedron No. Days Occurred, %																
	Acid			Basic									Blast			Coke	
	5	2	6	8	7	14	Iron nt	Si %	Slag	Scrap lbs/ton	Flue dust iron	Coke	Volume cfm	Moisture grains/cu ft	Temp °F	ash %	Burden ratio
1942																	
Apr.	....	21.42	17.85	10.71	42.85	7.14	917	1.50	666	307	315	1830	56755	5.92	1080	8.32	2.26
May	....	25.80	38.70	22.58	12.90	...	1051	1.26	672	230	285	1737	59840	5.03	1132	8.33	2.33
June	3.33	16.67	30.00	10.00	40.00	...	1026	1.20	634	217	300	1714	59282	6.49	1130	8.00	2.29
July	16.12	12.90	16.12	9.67	41.93	3.33	974	1.22	635	389	275	1737	58000	7.02	1144	8.09	2.29
Aug.	6.45	38.70	16.12	19.35	19.35	...	1047	1.09	596	388	210	1661	60000	6.72	1151	8.43	2.43
Sept.	10.00	16.66	30.00	20.00	23.33	...	995	1.19	626	314	280	1692	60000	5.91	1138	8.61	2.42
Oct.	19.35	19.35	6.45	12.93	41.93	...	982	1.15	632	269	155	1693	60500	4.47	1178	8.02	2.28
Nov.	3.33	6.66	60.00	10.00	20.00	...	1076	1.27	569	297	270	1590	63800	3.52	1125	7.73	2.52
Dec.	....	22.58	67.74	9.67	....	...	1012	1.18	569	305	295	1570	60200	2.63	1040	7.90	2.43
Avg.	6.76	20.08	31.33	13.88	26.92	0.87	1009	1.23	622	313	265	1689	59819	5.06	1124	8.01	2.36
1943																	
Jan.	....	25.80	64.51	6.45	3.22	...	982	1.13	579	239	310	1597	58811	...	1055	8.40	2.57
Feb.	3.57	35.71	25.00	14.28	21.42	...	1034	1.16	612	419	371	1580	59676	2.23	1065	8.86	2.52
Mar.	....	38.70	61.29	....	....	...	1128	1.02	561	373	313	1469	61473	2.25	941	8.36	2.68
Apr.	....	23.33	63.33	13.33	....	...	1077	1.05	579	317	305	1546	62697	2.80	973	8.20	2.55
May	....	29.03	70.97	....	....	...	1118	1.08	600	399	312	1521	62790	4.48	995	8.68	2.63
June	....	6.66	86.66	3.33	3.33	...	1051	1.15	571	318	334	1545	60636	6.42	1149	8.73	2.65
July	....	19.35	74.19	6.45	....	...	1080	1.35	554	327	327	1566	62549	6.62	1200	9.07	2.51
Aug.	....	19.35	67.74	6.44	3.22	3.22	1092	1.57	489	340	308	1539	61952	6.73	1175	9.02	2.47
Sept.	....	6.66	83.33	10.00	....	...	1108	1.15	577	312	281	1529	62609	6.39*	1133	9.09	2.57
Oct.	....	....	89.66	10.34	....	...	1110	1.27	615	316	405	1573	62778	6.00	1095	9.23	2.60
Nov.	....	3.33	76.67	20.00	....	...	1040	1.27	638	295	375	1618	62559	6.00*	1065	8.87	2.50
Dec.	....	6.45	77.42	16.13	....	...	964	1.28	621	232	349	1666	59505	4.00	1086	8.94	2.48
Avg.	0.97	17.86	70.06	8.89	2.60	0.27	1065	1.21	581	324	329	1551	61435	4.90	1077	8.78	2.56
1944														* Moisture control			
Jan.	....	9.68	83.87	3.22	3.22	...	872	1.13	558	298	243	1617	53565	2.08	1095	8.40	2.38
Feb.	....	48.28	34.48	10.34	6.90	...	948	1.35	628	309	255	1552	54511	1.92	990	8.90	2.62
Mar.	....	29.03	70.97	....	....	...	1008	1.43	588	351	291	1602	59804	2.03	1085	9.47	2.50
Apr.	3.33	36.67	40.00	13.33	6.67	...	1017	1.39	579	312	260	1631	61268	2.77	1135	9.63	2.35
May	....	45.16	48.39	....	6.45	...	941	1.61	600	318	190	1712	60015	4.96	1105	10.64	2.35
June	....	13.33	76.67	10.00	....	...	870	1.38	584	376	378	1818	57501	6.00	1125	11.34	2.33
July	....	3.23	64.51	32.26	....	...	803	1.61	758	343	376	1828	57554	5.82	1085	11.45	2.33
Aug.	....	....	64.52	29.03	6.45	...	603	2.27	650	498	358	1986	57653	6.11	1105	11.47	2.33
Sept.	16.67	36.66	20.00	16.67	10.00	...	674	2.04	630	427	263	1819	55748	5.51	1120	10.74	2.06
Oct.	12.90	35.48	32.26	3.23	12.90	3.23	798	2.33	651	384	274	1891	56517	3.55	1090	11.18	2.08
Nov.	3.45	34.49	24.13	10.33	27.60	...	920	2.27	530	513	245	1722	58989	2.84	1190	10.74	2.21
Dec.	....	6.44	41.93	25.80	22.60	3.23	880	1.51	636	440	235	1760	58047	1.88	1155	10.23	2.22
Avg.	3.03	24.87	50.14	12.85	8.56	0.54	861	1.64	641	381	252	1732	57597	3.79	1107	10.31	2.31
1945																	
Jan.	16.12	12.90	45.16	16.12	9.69	...	835	2.29	626	433	246	1752	53900	1.81	1190	10.94	2.35
Feb.	21.43	35 70	21.43	7.14	14.28	...	943	2.02	569	458	351	1641	58150	2.19	1160	10.34	2.19
Mar.	....	22.58	45.16	29.03	3.23	...	965	1.98	539	432	258	1640	59906	3.17	M40	10.53	2.26
Apr.	16.00	24.00	52.00	4.00	4.00	...	864	2.07	538	430	142	1619	59102	3.36	1205	10.72	2.24
May	32.26	19.35	22.58	19.35	6.46	...	906	2.02	607	422	238	1625	55099	3.80	1100	11.39	2.28
June	23.33	40.00	13.33	16.66	6.66	...	961	2.34	623	436	135	1615	56377	5.41	1225	11.30	2.28
July	16.15	54.80	19.35	9.68	....	...	849	2.07	653	353	167	1679	54219	6.19	1265	11.56	2.19
Aug.	22.60	25.80	22.60	9.68	19.35	...	783	2.32	703	346	126	1846	53455	5.91	1225	12.08	1.95
Sept.	6.66	20.00	23.33	26.66	23.33	...	792	1.98	695	296	172	1861	56132	5.50	1160	10.39	1.96
Oct.	12.90	38.71	16.15	6.44	25.80	...	841	2.83	672	355	139	1853	57594	3.45	1020	10.50	1.97
Nov.	31.03	6.90	17.24	13.79	24.13	6.90	846	1.91	672	315	222	1878	58883	3.01	1010	10.32	2.05
Dec.	35.50	29.02	12.90	9.68	12.00	...	737	2.53	656	195	169	2036	55817	2.32	1105	9.61	1.87
Avg.	19.50	27.48	25.93	14.02	12.41	0.59	860	2.20	629	372	197	1744	56353	3.84	1150	10.81	2.13

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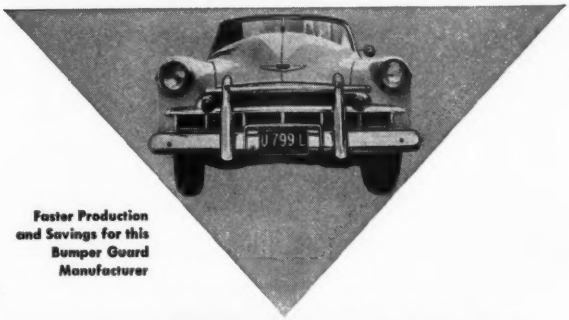

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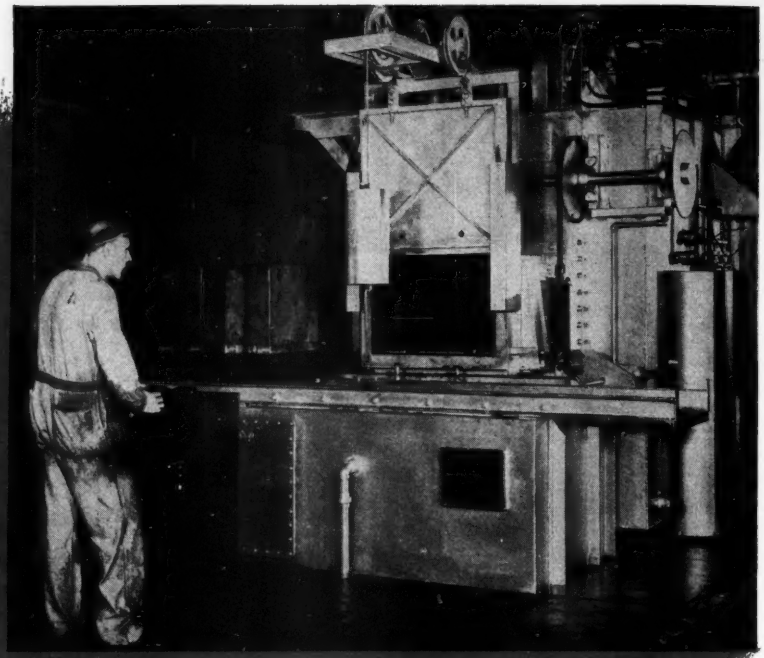

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High heating rates: Up to 200 lbs. per hr. of work per sq. ft. of hearth area. Gross furnace charges up to 1600 lbs. can be processed. Operating temperature range is 1375-1750°F. *Heating*: ALLCASE furnace features radiant tube heating with inherent advantages of forced convection. High speed fan recirculates atmosphere gases to provide uniform heating of dense loads, uniform case depth within the loads, and increased heating rates.

Less labor: Actual labor required in furnace operation is roughly 1/2 the time of 1 man. *Economy of operation*: For maximum capacity loads while dry cyaniding (to case depths of .007-.010-in.) between 1.2-1.5 cu. ft. of 1000 Btu gas are consumed per lb. of work treated.

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'Surface' INDUSTRIAL FURNACES

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possibility of consistently forming tetrahedron No. 6 tapping slag. The irregularity of the magnesia content in the stone, indicated by the range in the magnesia content in daily slag analyses, caused wide fluctuation in the tetrahedron classification of the slag from September 1944 through 1945. The combination of high alumina and magnesia percentages disturbed the furnace operation and is reflected in the practice data.

For the first seven months of 1944 the silicon content of the iron and the weight of scrap used are comparable to 1943; for the last five months both were increased. After the first two months the coke ash content increased. The blast volume was down for the year, voluntarily in January and February but forced by higher coke ash content in later months, and the effect is reflected in the tons of iron produced.

Output Is Reduced—In January and February, the affect of reduced blast volume is clearly reflected in the reduced production of iron and flue dust, compared with 1943, with immediate response in iron production in February to increase in blast over January. As the coke ash content increased the blast volume and burden ratios were forced down, iron production was down, with fuel rate and dust production up. Change in silicon content from August to the end of the year forced further reduction in burden.

Data for June, July, and August, are of special interest because of the uniformity in burden ratios, humidity, coke ash content, flue dust production, and blast volume. With these several influences the uniform effect of slag-mineral composition is again clearly indicated. June and July have the lower, and August the higher, silicon content. June has the best slag composition, with July and August following in the order named. June has the largest iron production followed by July and August. Although August had the highest silicon content it also had 32.5 per cent more scrap than June and 42.2 per cent more than July. June, with the largest iron production, also had the largest slag weight per ton of iron, namely 16.1 per cent greater than July and 38.0 per cent greater than August. Since these data cover three full monthly periods they clearly emphasize the fallacy of sacrificing slag-mineral composition to get lower weight of slag per ton of iron. Slag-mineral composition cannot cure the ill effect of high coke ash but it can minimize the ill-effect of it. These uniform factors relating to coke ash content and flue dust production, again clearly substantiate the effect of higher ash coke on the thermal and mechanical conditions in the furnace shaft.

TABLE V
AVERAGE DAILY SLAG ANALYSIS BY MONTHS FOR 1945

Month	Compound, Per cent SiO_2	Al_2O_3	CaO	MgO	Days by difference, Per cent acid	basic	Days by tetrahedron, Per cent acid	basic
January	33.65	17.05	43.10	4.68	77.40	22.60	74.18	25.81
February	34.05	16.85	41.55	5.88	78.60	21.40	77.56	21.42
March	34.00	16.45	43.77	4.41	80.70	19.30	67.74	32.26
April	34.53	16.98	41.84	4.99	96.00	4.00	92.00	8.00
May	34.39	16.72	40.88	6.51	77.40	22.60	74.19	25.81
June	35.02	16.63	40.23	6.87	86.60	13.40	76.66	23.32
July	35.66	16.65	40.34	6.47	87.10	12.90	90.30	9.68
August	34.04	15.46	41.68	7.13	90.40	9.60	71.00	29.00
September	34.33	15.93	41.71	6.54	70.00	30.00	49.99	49.99
October	33.69	17.75	40.52	6.64	80.70	19.30	67.76	32.24
November	32.60	17.25	41.97	6.39	65.60	34.40	55.17	44.82
December	34.05	17.46	40.42	6.74	83.90	16.10	77.42	21.88

Data of 1945 is a continuation of the operating conditions which began in the latter part of 1944. Relatively high-silicon iron prevailed throughout the year. Coke ash content was on the high side for all months except December. Blast volume was the lowest for the four years compared, partially due to higher ash coke and partially to slag composition. The weight of scrap used was greater in the first six months than in the last six and the effect is reflected in tons of iron produced.

Lacks Uniformity — The outstanding change in data, compared to the other three years, is in the tetrahedron classification of slag. The entire year is characterized by wide ranges in mineral composition and the lack of uniformity is reflected in the practice data.

The fallacy of being governed entirely by acid/base difference in slag classification is evident. Table V lists the average daily slag analyses by months to indicate the trend in the chemical composition of the burden materials. Classification of slag by acid/base difference is compared with the classification by tetrahedron. As indicated, the slags are more acid by difference than by tetrahedron classification but even though acid the greater part of the time (tetrahedrons Nos. 2, 5 and 6 = 72.90 per cent), the furnace practice for 1945 was the poorest of the four years compared. Higher coke ash and scrap weight used are unquestionably important factors in the practice, but the coke ash was not any higher in the last six months than it was in the first six. A comparison of the two periods shows that the last six months consistently had lower burden ratio, lower iron production, and higher fuel rate than the first six months with virtually the same silicon content in the iron. Flue dust production follows the blast volume and burden ratios.

December with the lowest coke ash content for the year had the lowest iron production, the lowest burden ratio, and the highest fuel rate for the year. Undoubtedly iron production was influenced by the low weight of scrap used and by the higher silicon content of the iron but at the same time the slag mineral composition was the poorest of the year.

Theoretical thermal effects of the slag composition are fully substantiated by the data of 1945 where percentages of tetrahedrons Nos. 5 and 6 are respectively the highest and the lowest for the four years compared. From the evidence presented it is reasonable to assume that the mineral composition of the slag caused the burden ratios for 1945 to be the lowest for the four-year period.

This four-year comparison of furnace practice data emphasizes these points:

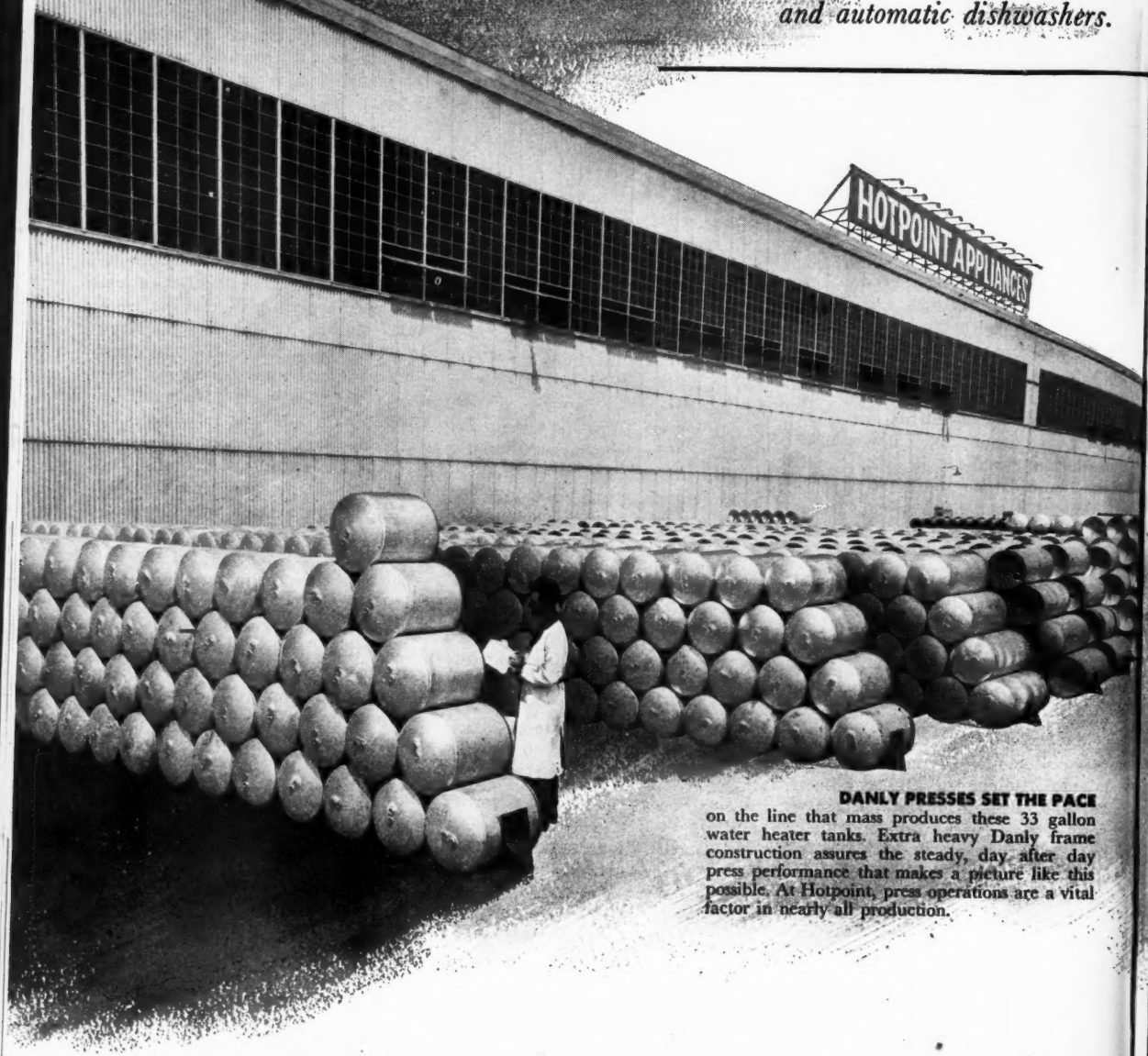
1. Importance of slag-mineral composition to blast furnace operating economy, because it governs the degree of efficiency with which heat can be used.

2. The fallacy of being governed entirely by acid/base difference in slag-chemical composition, because classification by difference is not accurate as an indicator of

DANLY PRESSES

PAY OFF AT HOTPOINT—

in plant 5 at Milwaukee where press work is the key to efficient, high speed production of electric water heaters and automatic dishwashers.



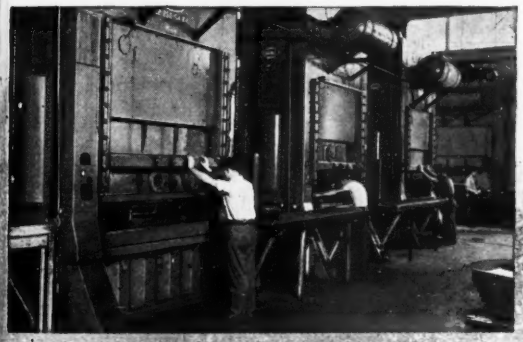
DANLY PRESSES SET THE PACE on the line that mass produces these 33 gallon water heater tanks. Extra heavy Danly frame construction assures the steady, day after day press performance that makes a picture like this possible. At Hotpoint, press operations are a vital factor in nearly all production.

Special Danly Press construction and engineering features assure the uninterrupted performance so important wherever production schedules run close to actual machine capacity. Just one of these features, the new Danly cool-running clutch, reduces clutch wear—a major cause of press down time. In over two years of operation, the Danly Presses at Hotpoint have required no major clutch maintenance . . . no relining and only 1 take-up!

Other outstanding Danly Press features include complete pressure lubrication and a specially designed control system. Write today for the new Danly Straight Side Press Catalog—check the specific advantages of Danly Presses in your plant.

JUST AS IT COMES FROM THE MILL, steel goes into production. The skidded stacks are simply unstrapped and fed directly to the Danly Press for blanking. The incoming steel storage area immediately adjacent to the beginning of the production line cuts down on costly material handling and simplifies stock control.

AT THE HEAD OF THE TANK LINE, the first operation is performed in this 500-ton Danly Press . . . a good way to start production! Tank Ends are blanked from 3/16" hot rolled steel in a 1 stage die at a rate as high as 220 pieces per hour. The circular blanks produced are approximately 22" in diameter.



. . . AND MAINTAIN THE PACE! This bank of four 250 ton Danlys, in addition to performing general purpose stamping operations, works almost continually to "take up the slack" in the entire stamping production schedule. Whenever production lags on one part or another, these Danly's keep the assembly line rolling. The fourth press in series is set at right angles to the others to increase flexibility of conveyor layouts.

SUPERVISING QUALITY assures high working standards and precision. Here, details of a reinforced water heater bottom stamped in three operations on a series of Danly Presses are checked. An interesting highlight is the quality control sample board in the background. The stamped parts are properly coded to provide a quick running check on die performance. New samples taken at frequent intervals give a true picture of current production quality.

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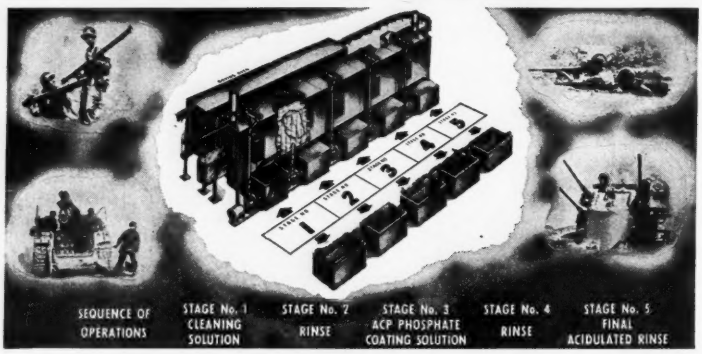
Technical Service Data Sheet

Subject: METAL PRESERVATION AND PAINT PROTECTION WITH ACP PHOSPHATE COATING CHEMICALS


SEQUENCE OF OPERATIONS
STAGE No. 1 CLEANING SOLUTION
STAGE No. 2 RINSE
STAGE No. 3 ACP PHOSPHATE COATING SOLUTION
STAGE No. 4 RINSE
STAGE No. 5 FINAL ACIDULATED RINSE

U.S. ARMY PHOTOGRAPHS COURTESY OF "ORDNANCE MAGAZINE"

Typical spray and dip phosphating equipment and some ordnance products that are now given a protective phosphate coating for extra durability under all kinds of severe exposure conditions. Both military and civilian applications of ACP phosphate coating chemicals are shown in the chart below.

SELECTION CHART OF ACP PROTECTIVE COATING CHEMICALS FOR STEEL, ZINC, AND ALUMINUM

METAL	ACP CHEMICAL	OBJECT OF COATING	TYPICAL METAL PRODUCTS TREATED	GOVERNMENT SPECIFICATIONS
STEEL	"GRANODINE" Zinc Phosphate Coating Chemical	Improved paint adhesion	Steel, iron, or zinc fabricated units or components, automobile bodies, refrigerators, washing machines, cabinets, etc.; projectiles, rockets, bombs, rifles, small arms, belt links, cartridge tanks, vehicular sheet metal, tank bolts and links, recoilless guns, etc.	MIL-S-5002 JAN-C-490, Grade 1 JAN-F-495 U.S.A. 57-0-2, Type II, Class C U.S.A. 51-70-1, Finish 22.02, Class C U.S.A. 50-60-1 16 E4 (Ships)
STEEL	"PERMADINE" Zinc Phosphate Coating Chemical	Rust and corrosion prevention	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components.	MIL-C-16232 U.S.A. 57-0-2, Type II, Class B U.S.A. 51-70-1, Finish 22.02, Class B Navy Aeronautical M-364 U.S.A. 72-53 (See AN-F-20)
STEEL	"THERMOIL-GRANODINE" Manganese-Iron Phosphate Coating	Wear-resistance anti-galling, safe break-in of friction or rubbing parts. Rust proofing.	Friction surfaces such as pistons, piston rings, gears, cylinder liners, camshafts, tappets, crankshafts, rocker arms, etc. Small arms, weapon components. Hardware items, etc.	MIL-C-16232 U.S.A. 57-0-2, Type II, Class A U.S.A. 51-70-1, Finish 22.02 Class A Navy Aeronautical M-364 U.S.A. 72-53 (See AN-F-20)
STEEL	"GRANODRAW" Zinc-Iron Phosphate Coating	Improved drawing, extrusion, and cold forming	Blanks and shells for cold forming, heavy stampings; tubs; tubing for forming or drawing; wire; rod; etc.	———
ALUMINUM	"ALODINE" Protective Coating	Improved paint adhesion and corrosion resistance	Aluminum products of similar design such as refrigerator parts, wall tile, signs, washing machine tubs, etc; aircraft and aircraft parts; bazookas (rocket launchers), helmets, belt buckles, clothes dryers, clothesline, rocket motors, etc., aluminum strip or sheet stock.	MIL-C-5541 (See also QPL-5541-1) MIL-S-5002 AN-F-20 U.S. Navord O.S. 675 16 E4 (Ships) AN-C-170 (See MIL-C-5541) U.S.A. 72-53 (See AN-F-20)
ZINC	"LITHOFORM" Zinc Phosphate Coating Chemical	Improved paint adhesion	Zinc alloy die castings; zinc or cadmium plated sheet or components; hot dip galvanized stock; galvanneal; signs; siding; roofing; galvanized truck bodies; etc.	QQ-P-416 RR-C-82 JAN-F-495 AN-F-20 U.S.N. Appendix 6 U.S.A. 72-53 (See AN-F-20)

CHEMICALS ACP PROCESSES

WRITE FOR DESCRIPTIVE FOLDERS ON THE ABOVE CHEMICALS AND FOR INFORMATION ON YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

thermal effects of slag of various degrees of acidity or basicity.

3. The fallacy of sacrificing slag-mineral composition to get lower weight of slag per ton of iron, because heat consumption by slag is not determined by weight alone but also by mineral composition.

4. The fallacy of ignoring alumina, because alumina is an important constituent in determining mineral composition of slag.

5. The fallacy of over-blowing a furnace to increase production, because when the critical balance between shaft and bosh and hearth work is reached, over-blowing destroys proper division of heat and consumes heat without increasing production.

6. Importance of silica in slag, because silica combines with all other constituents to form minerals, and must be present in proper ratio to other constituents to form the desirable mineral compounds.

7. Importance of ratio to each other of all four principal slag constituents, because it is ratio of all to each other which determines the mineral compounds formed. No fixed percentage of any single constituent is important in itself.

8. Importance of uniformity of content of slag-forming constituents in the furnace burden materials, because thermal conditions within the furnace cannot be uniform unless the factors which determine the conditions are uniform.

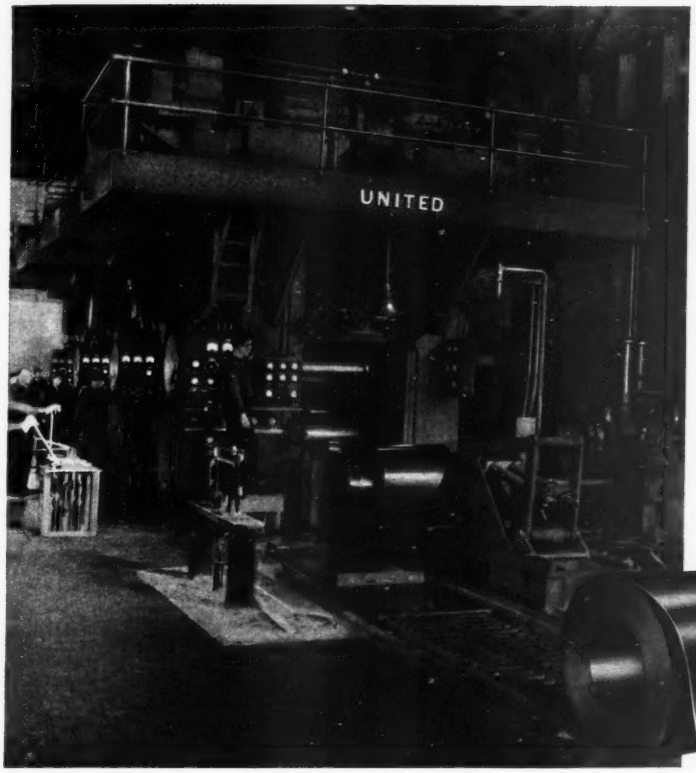
9. Importance in any iron ore beneficiation program of producing a product specifically designed to serve all thermochemical principles of blast furnace operation, because only through efficient use of heat can the beneficiation program cost be fully justified.

(*To be continued*)

Machine Shapes Titanium Rings

Experiments in draw forming titanium jet engine cross section rings on its rotary forming machine are successful, reports Cyril Bath Machinery Co., Cleveland. Work on the complex titanium rings was done jointly with General Electric Co.'s Aircraft Gas Turbine Division in Cincinnati.

The draw former is introduced to use the Bath method for shaping metals in a stretched and unheated state, instead of carving the shapes out of solid metal (STEEL, Dec. 31, 1951, p. 57). President Cyril Bath predicts successful forming will have a tremendous effect in cutting scrap losses. Titanium at $25 a pound, cannot be shaped conventionally with-



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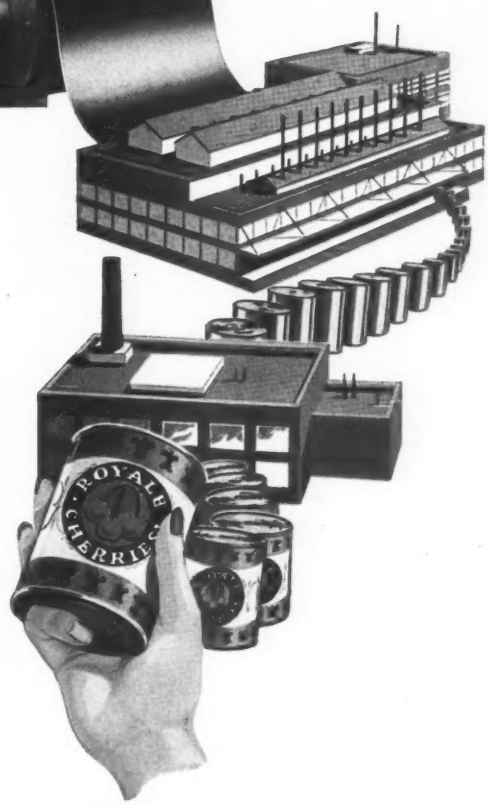

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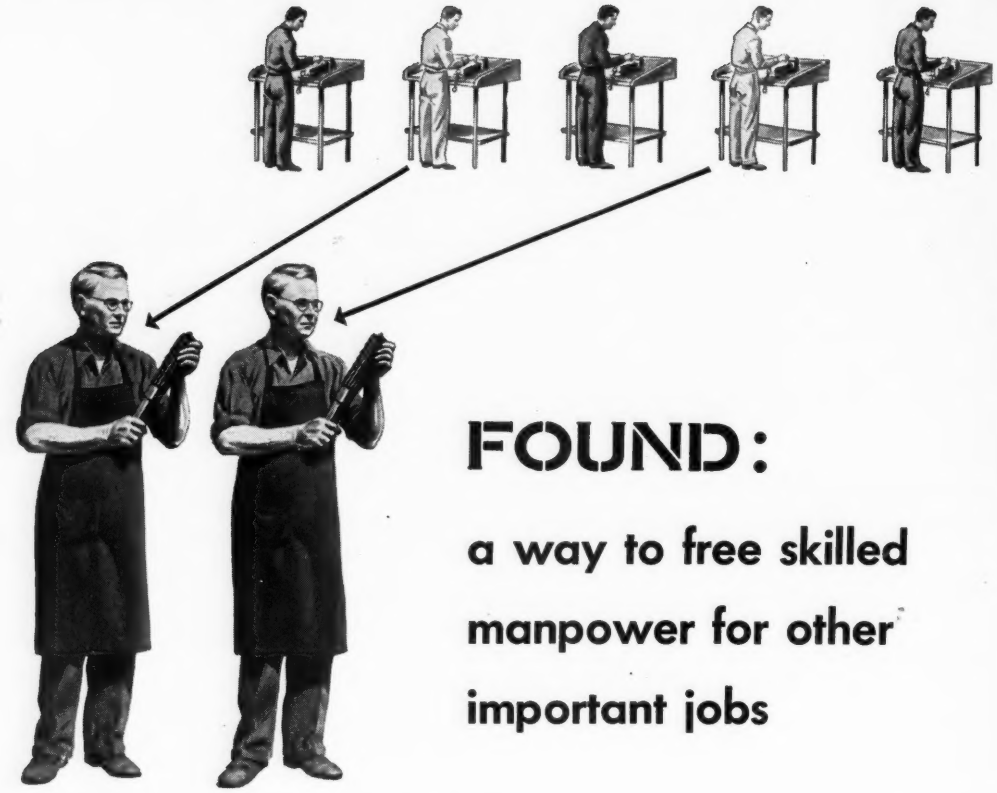
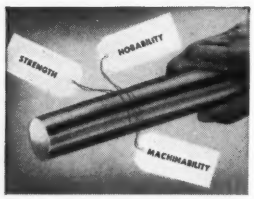
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

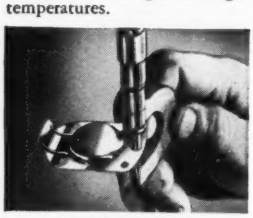


FOUND:

a way to free skilled manpower for other important jobs



Works better when the heat's on: "Give us a die casting die steel that fabricates easier and works better at elevated temperatures!" **A•E•S**ervice answered the need with Super Samson, the first die steel to combine good hobability, machinability and strength at high temperatures.

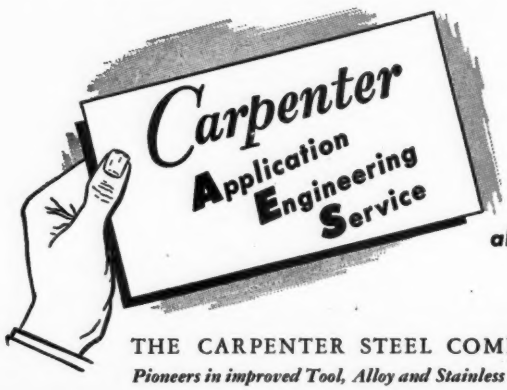


A closer fit with stainless: Few rejects, long tool life and high product quality result from stainless steel engineered to the job. To give Carpenter customers these advantages, **A•E•S**ervice came up with a new idea . . . Stainless *Servistrip*, providing closer hardness limits, better ductility, cleaner blanking.

Today many companies have found a way to use both manpower and equipment more effectively, through Carpenter's **A**pplication **E**ngineering **S**ervice.

A•E•Service is Carpenter's way of working alongside customers . . . helping them apply specialty steels to get maximum output from men and machinery. **A•E•S**ervice starts with the first bar labeled "Carpenter" you order. The bar is earmarked to do a specific service, like reducing production steps to free manpower, or making possible better products for more sales. That's why the Carpenter man probes *deeper* for facts on each job. He's after all the data he can get to apply the one steel best fitted to your needs. These goals represent a challenge we can't resist.

And **A•E•S**ervice is more. It's backed by field engineers rendering on-the-job service. It gets its vitality from a pioneering staff of laboratory specialists. These are the men responsible for many metallurgical "firsts" that have enabled Carpenter customers to be *first* with new products, and unusual, cost-saving methods. This is **A•E•S**ervice. Count on it to *continue* to work for those it serves.



***keeps* you ahead of competition**

THE CARPENTER STEEL COMPANY • READING, PA.

Pioneers in improved Tool, Alloy and Stainless Steels through continuing research

out prohibitive waste. To illustrate, Mr. Bath advances these estimates on comparative costs of processing a single 5-pound ring. For conventional carving, he says about 350 pounds of titanium, costing $8750, are necessary; done on the drawing machine, only 5½ pounds of the metal, worth about $135, are needed. This would mean a saving of over $8500 per ring.

Constructed to work the newer, tougher metals, the machine's size range is 12½ to 100 tons. In appearance, it looks like a huge phonograph player. Metal to be shaped is drawn under constantly equalized pressure between an arm and slowly revolving table.

AWS Welding Paper Reprinted

Eight-page reprint of a technical paper, "Dilution and Diffusion Aspects of Nonfusion Welding," presented at the annual meeting of the American Welding Society, is available from Eutectic Welding Alloys Corp., Flushing, N. Y. Subtitled, "Science of Physiochemical Phenomena and Thermodynamic Data Applied to a Better Understanding of the Brazing Process," the paper is illustrated and documented with charts, diagrams, tables and formulae derivations.

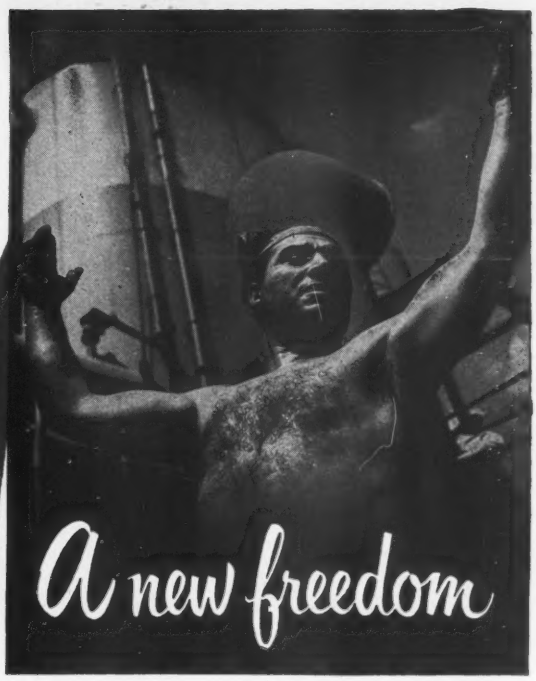
Booklet is part of a series prepared for reference of engineers and supervisory personnel in industries using the company's products. Other illustrated booklets, also available without charge include the 72-page "Manual of Design and Welding Engineering." Requests for copies should go to Dept. P, 172nd St. and Northern Blvd., Flushing, N. Y.

Jet Cones Resistance Welded

Cone assemblies for jet aircraft engines are reported produced by resistance seam welding in less time than was previously required. The welder, developed by Taylor-Winfield Corp., Warren, O., is equipped with a special planetary heat that makes a continuous circular seam weld around individual coupling connections at regular intervals around the cone assembly.

As each coupling is welded, the assembly is shifted progressively over clamping die until each subsequent coupling has been brought into line between the electrodes.

Across the face of the World a new Freedom spreads . . . like a strong man's smile . . . a Freedom from heavy burdens . . . a Freedom from beastly toil . . . a Freedom from useless costs . . . a Freedom from waste and spoil . . . It is a Freedom brought by Machines . . . and by Methods created by Men who engineer history for the greatest good of their Kind.



IN A WORLD divided by Iron Curtains and conflicting ideologies, it is refreshing to contemplate a better tomorrow made possible by a new-found freedom available to all—the Freedom from Toil, a Freedom springing from the use of modern machines.

The Clark Equipment Company is proud to have contributed to the emancipation of the laboring man through the development and creation of machines to bear his most exhausting physical burdens.

Ⓐ Electric-Powered HAND TRUCK with Stacker. Ⓑ TRUCLOADER with CRANE Attachment—1000 lb. cap.—gas or electric power. Ⓒ CLIPPER with RAM Attachment—2000 lb. cap.—gas or electric power. Ⓓ CARLOADER with BARTEL Device—3-4-5000 lb. cap. gas or electric power. Ⓔ YARDLIFT with SHOVEL Attachment 2-4-6000 lb. cap. gas power only. Ⓕ UTILITRUC with CLAMP Attachment 6-7-10,000 lb. cap. gas or electric power. Ⓖ YARDLIFT—150 with Standard Forks 15,000 lb. cap. gas power only. Ⓗ CLARKTOR—100-10,000 lb. draw bar pull. Ⓘ CLARKTOR—47 to 104 tons hauling capacity on level. Ⓙ CLARKETTE—5-10 tons hauling capacity on level. Ⓚ CLARKAT—42 to 58 tons hauling capacity on level. Ⓛ TRUCTRACTOR—Dump model 4000 lbs. capacity. Ⓜ TRUCTRACTOR—Tip-model 4000 lbs. capacity.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

These Clark publications will help you and your workmen to enjoy the many benefits of this New Freedom. Any one—or all—of them will be sent to you upon request

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A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST

Michigan
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WELDED
STEEL
TUBING

A Quality Product

Vacuum Cleaner Handle

ROUND
⅜" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge
Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

An excellent example of how the use of welded steel tubing simplifies assembly of parts, cuts down costs, is the cleaner handle made by Michigan for manufacturers of vacuum cleaners.

The handle is shipped by Michigan ready for chrome finishing and assembly to the vacuum cleaner. Stampings for the cord holders are welded to the tubing, an elongated hole punched for the interior wire cord and tumbler switch. The surface finish of the cold rolled steel tubing, as processed by Michigan, is suitable for polishing and chrome plating.

No matter what you manufacture, Michigan engineers will be pleased to consult with you concerning an application of welded steel tubing to improve your product and lower production costs.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

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Michigan STEEL TUBE PRODUCTS CO.
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Production Heat Treating

(*Continued from Page* 84)

left hand door and withdraws them from the right hand door for quenching. Work moves to the right in a circular path. The working hearth is 24 inches wide and rotates within a circle of 8 feet 3 inches diameter.

Thirty-Minute Treatment—Furnace temperature is held at 1550° F; each part is exposed to this heat for approximately 30 minutes. The lever shafts of SAE 8645 steel are quenched in oil; steering arms of SAE 1040 steel are quenched in water. Oil-quenched parts are then washed.

To relieve any quenching strains, these parts are next drawn for a minimum of 1½ hours at 900° to 1000° F, for the SAE-1040 arms, and at 1050° to 1160° F for the same period of time for the SAE-8640 shafts. This time is increased for certain parts requiring subsequent machining operations. A mechanical cleaning follows the drawing operation.

Central Atmosphere Source—Requirements inherent in properly compounding prepared atmosphere for three distinct heat treat processes—carburizing, dry cyaniding and clean hardening—are complex. The problems were solved by centrally locating two Surface Combustion RX atmosphere generators of 2400 cfh capacity each, and manifolding the RX carrier gas for all our atmosphere requirements.

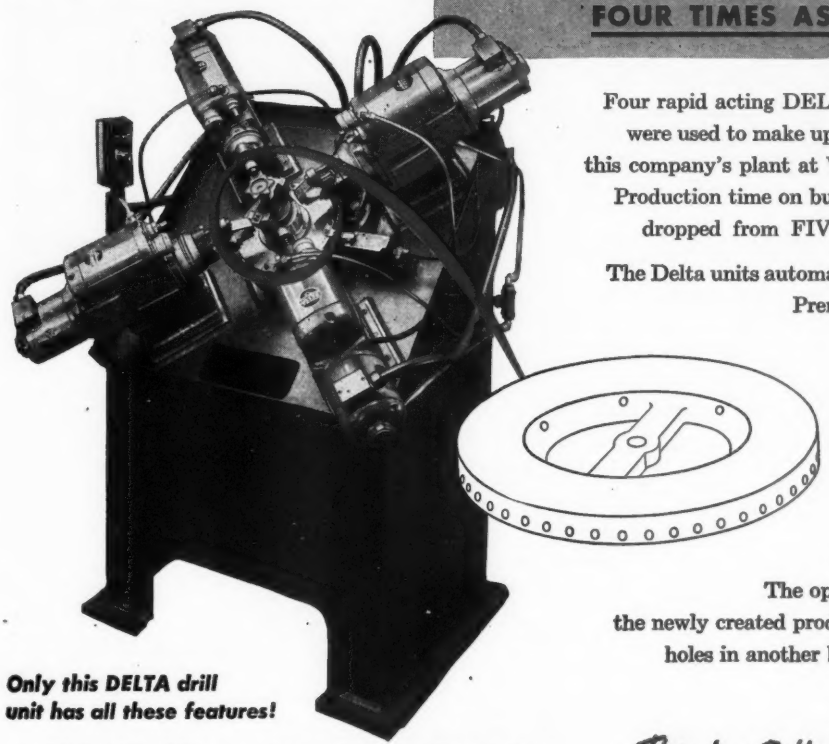
Composition of carrier gas produced by these generators is easily controllable at the generator. By simply setting a dial which regulates a variable orifice in the mixer, ratio of air and natural gas are changed to predetermined limits. Hydrocarbon or ammonia additions at the point of use can further modify this carrier gas for specific requirements.

Carburizing pit furnaces require 250 cfh of carrier gas and 40 cfh of natural gas, for each furnace. This carburizing atmosphere is substantially the same as that used for dry cyaniding, but is minus the ammonia additions. Although the first pit furnaces incorporated built-in RX generators, all four units are now manifolded to the central RX atmosphere source.

Stove Maker Boosts Production 400%

with the NEW DELTA Air POWERED Hydraulic DRILL UNIT

PRENTISS-WABER PRODUCTS COMPANY
Now Drills Gas Stove Burner Cap Holes
FOUR TIMES AS FAST!



Four rapid acting DELTA Model 19-150 Drill Units were used to make up a special-purpose machine at this company's plant at Wisconsin Rapids, Wisconsin. Production time on burner cap drilling immediately dropped from FIVE minutes to ONE minute!

The Delta units automatically drill 48 No. 37 holes in Prentiss-Waber's standard burner caps in 0.94 minutes, and 56 holes in their giant burner caps in 1.01 minutes. After the part is loaded, the machine automatically completes 12 consecutive cycles of drill, index, drill and index—then stops itself. The operator in the meantime using the newly created production time, drills six No. 37 holes in another burner cap!—a free operation any way you look at it . . .

Only this DELTA drill unit has all these features!

- ★ **HYDRAULIC FEED** . . . quickly adjusted, infinitely variable—no recamming or changing lead screws to alter feed.
- ★ **RAPID TRAVERSE** . . . quick, accurate, positive control—no over-travel; reduces tool breakage. Approach consistently at 5 to 6 inches per second to within .010 inch of work.
- ★ **DEPTH CONTROL** . . . quick, accurate, positive—no over-travel; repeats depth consistently to within .0005 inch.
- ★ **UNIVERSAL MOUNTING** . . . units can mount in any position.
- ★ **AUTOMATIC CYCLING** . . . built-in cycle control switches provide for full electrical remote control. Eliminates installing external switches. Drilling units positively electrically interlocked with automatic indexing table.
- ★ **SPECIAL SPINDLES** . . . drive arrangements and other features are available at slight additional cost, including new two-way valve to permit spindle to function with normal rapid retraction or to back feed, as desired.

Two sizes—capacities up to 5/16-inch diameter drill and 5/8-inch diameter drill.

DELTA TOOLS
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There's a Delta Power Tool for Your Job-
WOOD OR METAL WORKING

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DEFENSE TIME
EVERY TIME
"Standard's"
Welded Mechanical Steel Tubing
MAKES THE TOUGHEST TUBING FABRICATION POSSIBLE
automobile propeller
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If you need the best tubing for civilian or defense purposes, "Standard's" Mechanical Steel Tubing can really "take it".
Automobile manufacturers too, know "Standard" welded tubing safely stands the severest tubular applications. This is proven in the automobile propeller shaft that operates safely and dependably at high R.P.M.'s day in and day out.
Peace time, defense time, every time—"Standard's" modern facilities, and 25 years of tubing know-how, assure you the highest quality tubing available.
Specify "Standard" —IT PAYS!
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Welded Tubing
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STANDARDIZE with STANDARD — It Pays
CARBON STEEL TUBING
½" O.D. to 5½" O.D.
.028 to .260 wall
STAINLESS STEEL TUBING
⅜" O.D. to 3" O.D.
.028 to .095 wall

Net loads average 1500 pounds of cams.

Dry cyaniding belt furnace utilizes carrier gas at the rate of 750 cfh plus an additional 100 cfh of ammonia and 50 cfh of natural gas. These additions enrich the comparatively nonreactive carrier gas with carbon and nascent nitrogen to produce the case desired. The enriching natural gas is introduced through a mixer at the furnace source while the ammonia is taken direct from pressure bottles located immediately adjacent to the furnace. It is added to the atmosphere just prior to its introduction to the belt furnace heating chamber. Production rates of 250-300 pounds per hour are average.

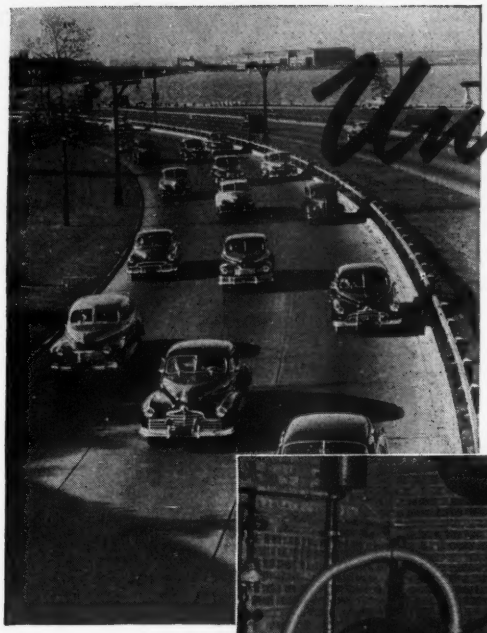
Straight carrier gas used for clean hardening is taken directly from the generators. The rotary hearth furnace requires about 1000 cfh of the carrier gas, without enriching. The generated carrier gas contains a trace of water vapor that is readily detectable by a dew point determination.

To maintain close control over these critical atmospheres, as generated and at point of use, dew point checks and Orsat tests are taken once each day for every piece of atmosphere apparatus, including the furnaces and generators. This is important. The enriching additions affect atmosphere dew point for each variation in composition. The lower the the dew point achieved, the higher the carbon potential available.

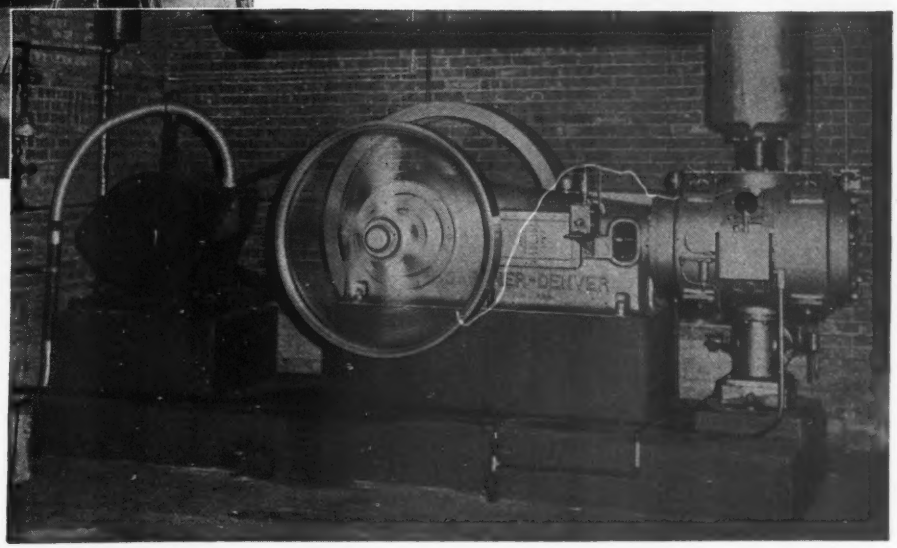
Air Conditioners Described

Engineering bulletin published by Buffalo Forge Co., Buffalo, describes the company's model G air conditioning cabinets. These central units are available in horizontal and vertical models, in sizes from 875 to 22,000 cu ft of conditioned air per minute. A number of changes designed to bring about greater efficiency and flexibility, simplify installation and ease maintenance are outlined.

In addition, the bulletin includes capacity tables, diagrams, charts and detail photos to aid in selecting the proper unit for given conditions. Engineers can obtain copies by requesting bulletin 3703A.



Unrestricted Flow



Gardner-Denver RX Single-Stage Compressors are made in a wide range of sizes to assure the right pressure and capacity for your needs.

. . . another reason why GARDNER-DENVER RX compressors save you money!

Free and easy! That's the way air flows through the large, unrestricted valve and port areas in the Gardner-Denver RX Compressor. That means the RX uses less power to supply the compressed air you need—and there you have one of the big reasons why an RX costs less to operate.

Other money-saving RX features include the dust-tight, heavy-duty power end—automatic lubrication—and "Air-Cushioned" Duo-Plate valves. Write today for additional information.

SINCE 1859

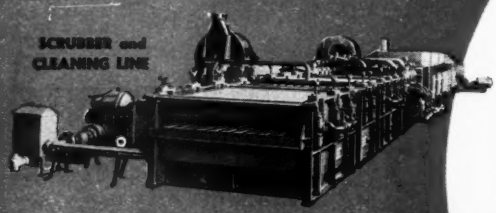
GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

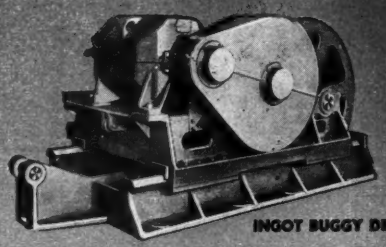
THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

STEEL MILLS Rely on F&Y

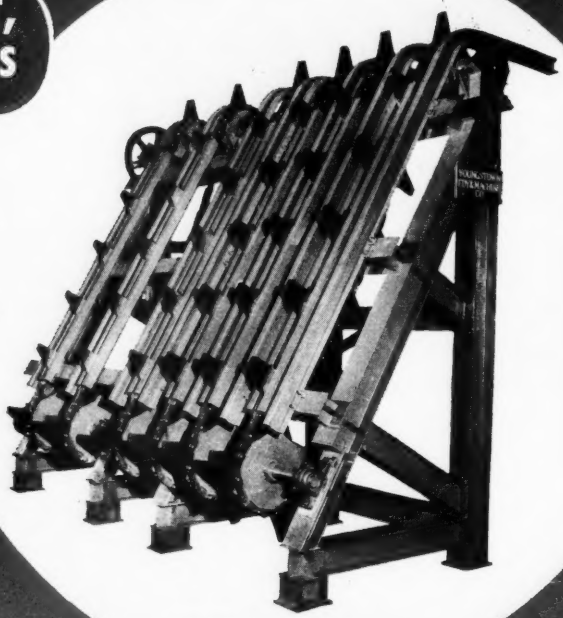
for **MACHINES, EQUIPMENT, ROLLS AND CASTINGS**



SCRUBBER and CLEANING LINE



INGOT BUGGY DRIVE



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- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
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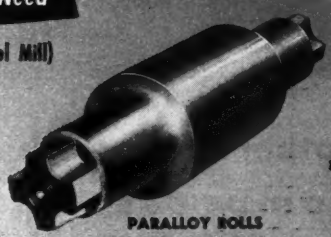
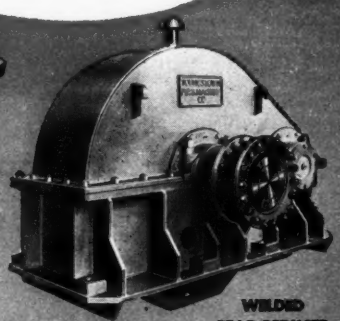
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

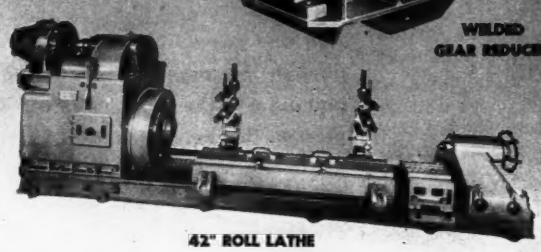
Machinery Built to Customer's Design and Detail Drawings



PARALLOY ROLLS



WELDED GEAR REDUCER



42" ROLL LATHE

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

6+

Chucking Machines Cut Costs

Six automatic chucking machines, installed by Walter Kidde & Co. at their Beltsville, N. J., plant, are finishing parts at a favorable cost ratio of 3.5:1 over the former method. Equipment was made by Warner & Swasey Co., Cleveland, for turning and chucking on nine different parts. Turning heads and cross slide cutter blocks for combining turning and boring cuts, perform five separate sets of operations automatically.

Adjustable trips on the selector drum control feed, speed change

AUTOMATIC TURNING, CHUCKING
. . . a favorable 3.5:1 cost ratio

and length of cutting stroke. Either or both cross slides can be selected to operate with all turret faces. Two or more machines are controlled by the operator, whose job is limited to changing pieces and starting and stopping the machines. All other operations are predetermined by operational set-up and are automatically controlled.

Castings Made Pressure-Proof

Applications are expanding for vacuum impregnation with sodium silicate or other heat-resistant materials to make castings pressure proof, reports F. J. Stokes Machine Co., Philadelphia. The company says about half the work done with the process is in regular production line impregnation; the rest is in production salvage. Many manufacturers include vacuum impregnation as a standard produc-

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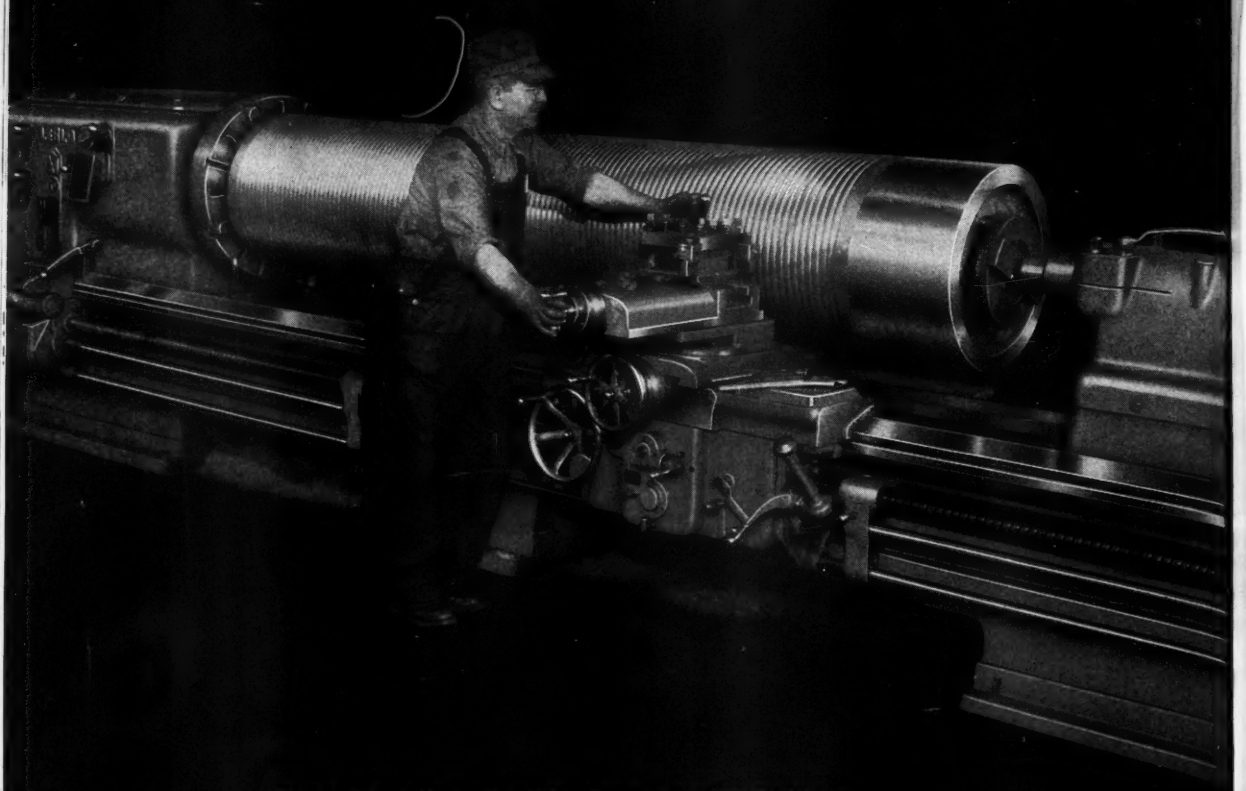
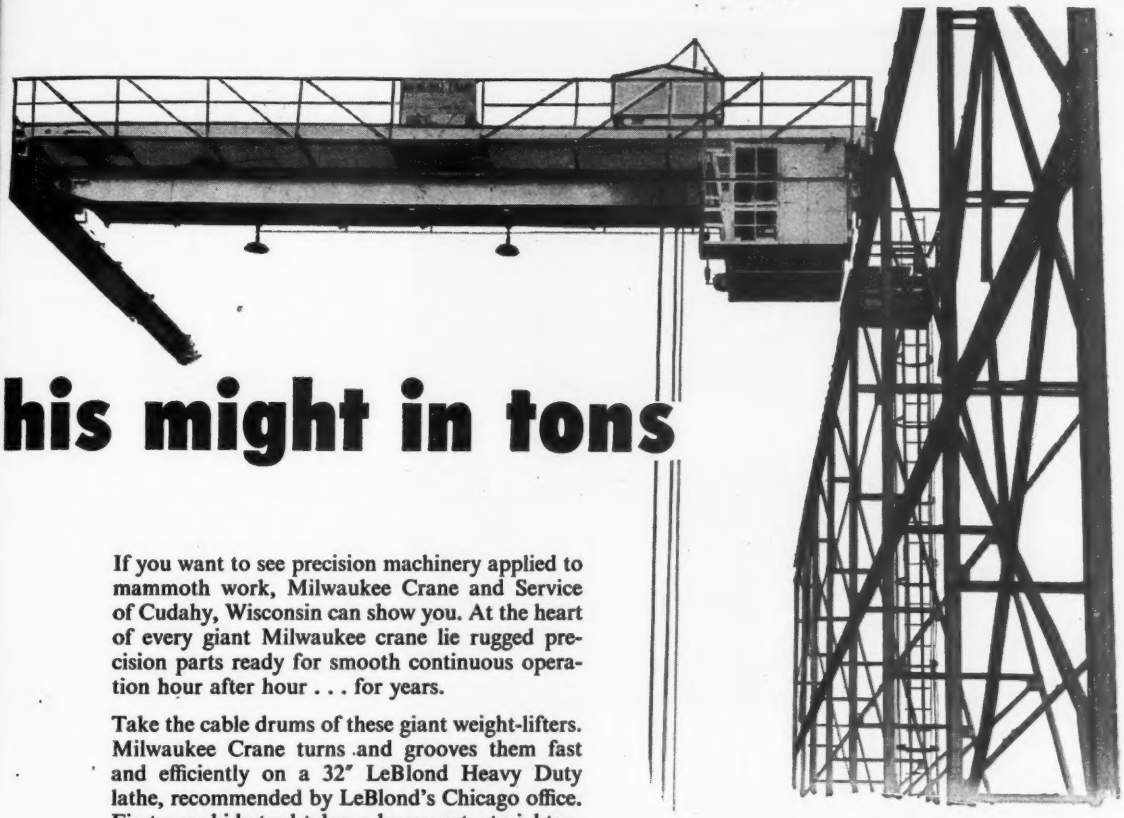
this weight-lifter measures



Milwaukee Crane and Service Co. of Cudahy, Wisconsin uses a 32" LeBlond Heavy Duty to machine cable-drums for their big cranes. A single cut, the full length of the work, straightens and sizes the castings. Spindle speed, 18 rpm; feed, .062 ipr; depth of cut, 1"; tool, carbide. Spiral cable grooves are then chased with a high-speed steel form cutter. Spindle speed, 8 rpm; depth of cut, .062". Other work performed by Milwaukee Crane and Service Co. on their LeBlond lathes includes turning and boring gear blanks, crane wheels, pulleys, shafts, and couplings.



his might in tons

If you want to see precision machinery applied to mammoth work, Milwaukee Crane and Service of Cudahy, Wisconsin can show you. At the heart of every giant Milwaukee crane lie rugged precision parts ready for smooth continuous operation hour after hour . . . for years.

Take the cable drums of these giant weight-lifters. Milwaukee Crane turns and grooves them fast and efficiently on a 32″ LeBlond Heavy Duty lathe, recommended by LeBlond's Chicago office. First a carbide tool takes a heavy cut, straightening and sizing the 8000-pound cast drums. Then the seat for the cable winding is grooved with a high-speed steel form tool much like a thread-chasing operation. These fast, chatter-free operations fit Milwaukee Crane's needs like a crane-operator's glove.

Big jobs like this get pared to workable size by the new 32″ LeBlond Heavy Duty lathe with standard 4-way rapid traverse. The 32-speed spindle, rigidly supported by four anti-friction bearings, is smoothly driven by hardened and ground steel gears. Other well-known LeBlond features are, of course, standard equipment—hardened and ground replaceable steel bed ways, totally enclosed quick change box, thrustlock tailstock, and many more.

Whether you turn massive workpieces to close tolerances or "watch charm" parts in mass production, LeBlond has a lathe that will turn them faster, better. Your nearby LeBlond distributor will tell you about LeBlond's complete line. Call him or write

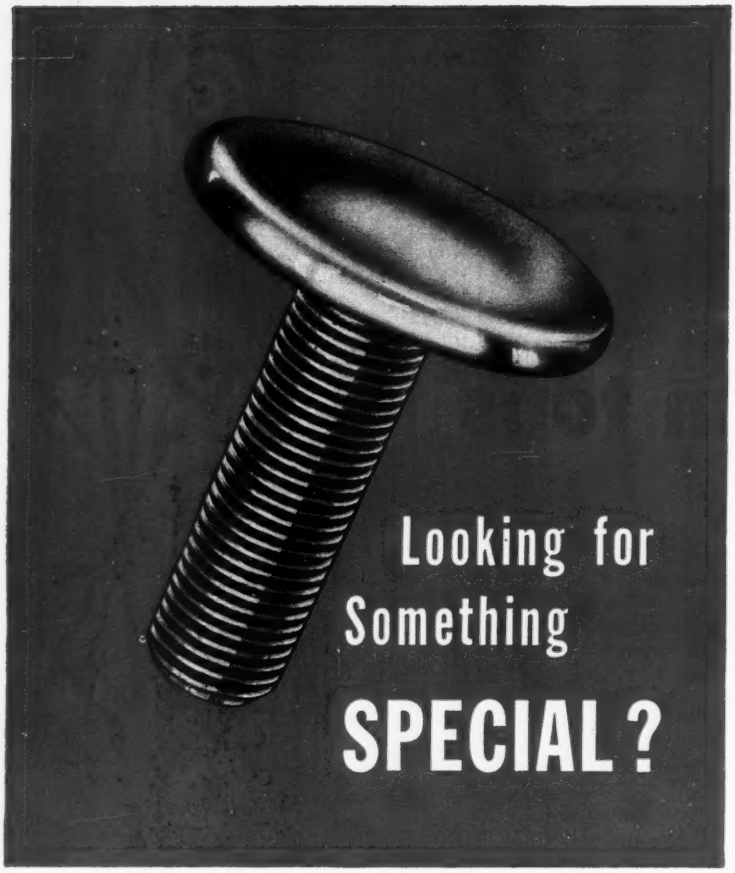
THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

Ask for Bulletin HD 163 G
for more information on the
32″ LeBlond Heavy Duty Lathe

turned faster by

LeBLOND
of Cincinnati

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 64 YEARS*



● You can find the answer to your special fastener problems in a Circle Ⓑ bolt designed and made for your job. We'd like to show you how these special fasteners can add strength to your products while simplifying design and production problems. Follow the lead of well known producers who agree that "the best start to end fastener problems is to call in Buffalo Bolt."

● The NO. 51 Catalog is the simplest, most concise and complete catalog to specify and order fasteners. Let us send it to you.

BUFFALO
BOLT COMPANY
Division of Buffalo-Eclipse Corporation
North Tonawanda, N. Y.
Sales Offices in Principal Cities
PRODUCERS OF CIRCLE Ⓑ PRODUCTS — BOLTS • NUTS • RIVETS AND SPECIAL FASTENERS

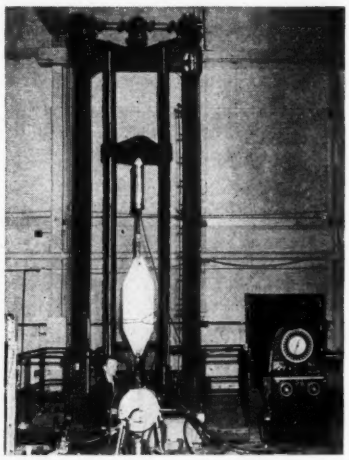
tion step to avoid placing occasional defective castings into service.

Usefulness in correcting faults is limited to capillary defects, not visible porosities that permit spurting under hydraulic pressure. Castings to be impregnated are placed in a vacuum chamber from which air is removed with a high-vacuum pump. Then compound is introduced into the chamber, filling all capillary voids. Jet engine compressor housings and magnesium-alloy gear boxes are among products treated successfully by the process.

Booklet Details Tube Failures

Factors affecting tube life in high - pressure, high - temperature applications are presented in a 40-page illustrated booklet published by Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa. The booklet, TR 516, presents results of many investigations of failures in carbon steel, intermediate chromium-molybdenum alloy steel and stainless steel tubing. Failures occurred in boilers, cracking stills, heaters and heat exchangers during service at elevated temperatures and pressures when used for power, oil and chemical processing. Copies are avail-

Skin Splice Put to the Test



FATIGUE TEST proves the strength of an airplane wing skin splice in the Structures Testing Laboratory at Chance Vought Aircraft Co., Dallas. A 300,000-pound Baldwin testing machine weighs alternate high and low tension loads applied by a loading jack fastened to upper crosshead

we never use rule of thumb ..

in the making of

WICKWIRE WIRE

RULE OF THUMB plays no part in the scheme of things at Wickwire. Close laboratory control over the quality of Wickwire Wire... testing and inspection through every stage of manufacture involves precision instruments and equipment of hair-splitting accuracy.

Because Wickwire quality control is complete and uninterrupted from actual steel making to finished wire, you can depend on Wickwire Wire for constant adherence to rigid standards of uniformity in quality, size, tensile strength and stiffness.

Let us know your needs in specialty steel wire. We are prepared to meet your most exacting specifications for wire of high or low carbon steel... round or shaped... in all tempers, grades and finishes.

Remember: FOR THE WIRE YOU REQUIRE—CHECK FIRST WITH WICKWIRE.

For additional information write or phone our nearest sales office.

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WICKWIRE WIRE

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PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
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SCREEN IT ACCURATELY

SCREEN IT ECONOMICALLY

—on Hewitt-Robins Vibrating Screens

You need closest possible control of sizes. You need lowest possible cost per ton. You can get both by putting the right vibrating screen on the job.

Here's where Hewitt-Robins can help. We introduced the circle-throw principle. We originated the elliptical throw. Today, we make vibrating screens in a wide range of types and kinds . . . handling everything from 9,000-lb. rocks to tiny specks . . . to perform every operation from scalping through sizing to dewatering.

The line of Hewitt-Robins Vibrating Screens is complete . . . ranging from 16" x 30" to 72" x 192" . . . floor-mounted or suspended . . . with one, two or three decks.

Proper sizing is no problem . . . when you put it up to Hewitt-Robins. Your cost per ton will be low. Your maintenance expense will be minor; many Hewitt-Robins Vibrating Screens are still going strong after more than 12 to 20 years of continuous service.

Screen your product accurately. Screen it economically . . . on Hewitt-Robins Vibrating Screens. Tell us your need. We'll give you the *one best* answer. Write to Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Avenue, Passaic, New Jersey.

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Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

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BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
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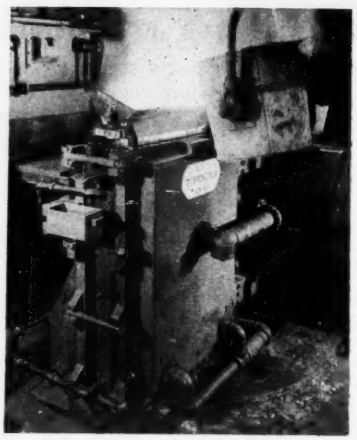
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

able free on request to the division's general offices.

Mold Casts 8000-Pound Cakes

Water-cooled slab mold built by Torrington Mfg. Co., Torrington, Conn., casts 8000-pound Muntz metal slabs. Made for the New Bedford, Mass., plant of Revere Copper & Brass Co., the big mold weighs more than 40,000 pounds and stands 8 feet high. It is designed so eventually it will cast 10,000-pound cakes 10 inches thick.

In addition to its size, an outstanding feature of JM-61 is the



WATER-COOLED SLAB MOLD
. . . 4000 gpm holds down heat

effective but intricate cooling system. To get maximum cooling power, a honeycomb-shaped compartment is built behind each 3-inch copper plate. As the mold is filled, up to 4000 gallons of coolant per minute flow through to cool the mold and carry off heat from the cast bar. Water temperature rises about 10 degrees in passage through the mold.

Strip Heaters Warm Hopper Cars

Strip heaters installed under the floor of its 60-ton bottom dump ore transfer cars by Atlas Car & Mfg. Co., Cleveland, prevent ore from freezing and sticking during winter months. Made by General Electric Co., Schenectady, N. Y., the heaters replace the burning coke previously used in hopper bottoms to keep ore loose until it could be dumped into bins on blast furnace high lines.

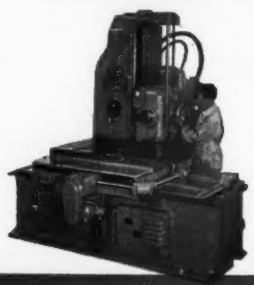
Heaters are clamped directly to

THE "JIGMIL TECHNIQUE"

OBSOLETES JIGS

for Precision Boring Operations on Small Lot Production

TYPICAL JOB TAKEN FROM OUR JIGMIL CASE HISTORY FILE



PART • Cast-Iron Gearbox.
OPERATION • Bore and Counterbore 13 Holes Ranging from 1.8505" to 2.8335". Face Two 3½" Diameter Bosses.

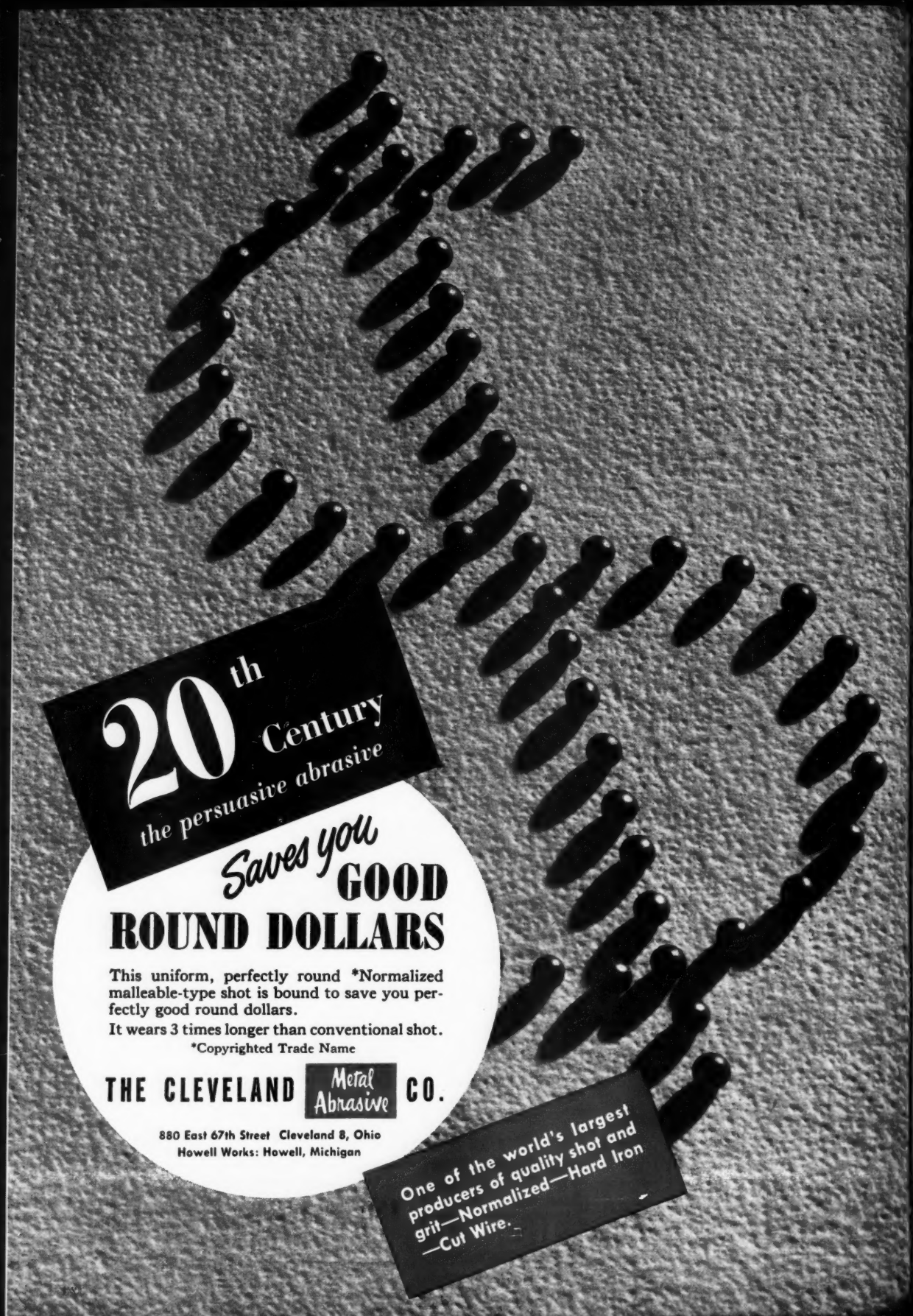
FLOOR TO FLOOR TIME • 75 Minutes.
TOLERANCE ON HOLE SPACING • .0005".
TOLERANCE ON BORE DIAMETERS • .0004".

"Come to Detroit and investigate the Jigmil Technique"

Demonstrations at our Plant by appointment.

DEVLIEG MACHINE CO. DEVLIEG JIGMIL **450 FAIR AVE. FERNDALE 20 (DETROIT) MICH.**

Send for Illustrated Jigmil Catalog

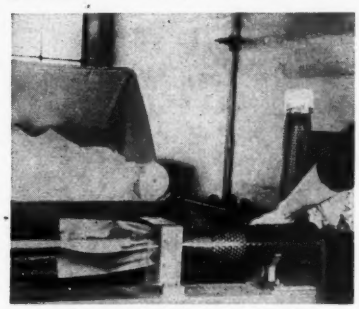

20th Century
the persuasive abrasive
Saves you GOOD ROUND DOLLARS
This uniform, perfectly round *Normalized malleable-type shot is bound to save you perfectly good round dollars.
It wears 3 times longer than conventional shot.
*Copyrighted Trade Name
THE CLEVELAND Metal Abrasive CO.
880 East 67th Street Cleveland 8, Ohio
Howell Works: Howell, Michigan
One of the world's largest producers of quality shot and grit—Normalized—Hard Iron —Cut Wire.

the hopper plates in a manner that allows for expansion and contraction and makes individual units easy to replace. This application also achieves a maximum amount of heat by conduction to the plates. Each group is connected to a fused safety switch at the control panel to ease maintenance. Enclosures used are thermal insulated steel cabinets. Their effect is to make heat lost by convection to the surrounding air help warm the hoppers.

To avoid unnecessary use and conserve power, GE has installed a heavy duty industrial thermostat, adjusted to cut off power when no heat is needed. Heaters are disconnected manually by a switch in the contactors' coil.

Shell Line Is Escape Valve

Polyethylene plastic answers the need for a cartridge case liner that keeps powder dry, but vaporizes instantly to achieve recoiless firing. Chemically inert, polyethylene maintains flexibility at low temperatures. It keeps moisture from



PLASTIC CARTRIDGE LINERS
. . . flexibility at low temperatures

reaching propellant powder through perforations in the case that permit gases to escape out the breach and eliminate kickback

Cartridge case liners for recoilless rifle ammunition, made of Bakelite polyethylene plastic, are fabricated by Hungerford Plastics Corp., Rockaway, N. J. Liners made of plastic film sealed to a thick base molded of the same material are first inserted into the perforated case for a rifle round. Smokless propellant powder is then loaded into a bag inside the liner. Relatively low temperature heat seals the liner's open end without danger to personnel.

When the round is fired, heat of

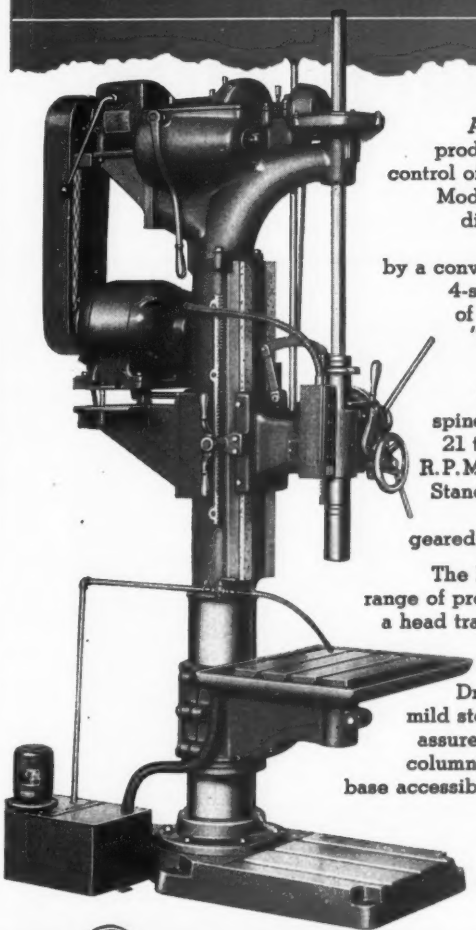
NOTICE

The New

SIBLEY MODEL D

DRILLING MACHINES

in 24" and 28" SWING



An operator gains greater productivity from the ease of control offered by the new Sibley Model D. The V-belt drive is direct to a 4-speed geared transmission, controlled by a conveniently located lever. A 4-station switch at the front of the machine includes an "inching" button to facilitate changing speeds.

Three optional ranges of spindle speeds are available: 21 to 365 R.P.M.; 25 to 419 R.P.M.; and 37 to 650 R.P.M. Standard equipment includes automatic spindle stop; geared power feeds; back gears.

The Model D handles a wide range of precision drilling jobs with a head travel on the hand scraped column of 25" and a spindle feed of 11". Drilling capacity is 1¾" in mild steel. The heavy table arm assures rigidity and swings on column, to make the machined base accessible for a working surface.

Model D-24 Drilling Machine is illustrated complete with coolant pump and fittings, electrical reversing, 5 H. P. motor, magnetic starting switch, and rectangular oil groove table.

SIBLEY
MACHINE & FOUNDRY CORP.
52 EAST TUTT STREET
SOUTH BEND 23, INDIANA

SIBLEY MACHINE & FOUNDRY CORP.
52 East Tutt St., South Bend 23, Indiana
Send Catalog No. 67.

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Company_____

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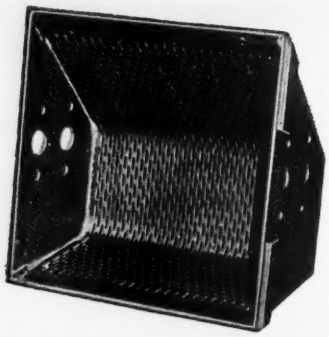
City_____ State_____

Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

HENDRICK

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Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
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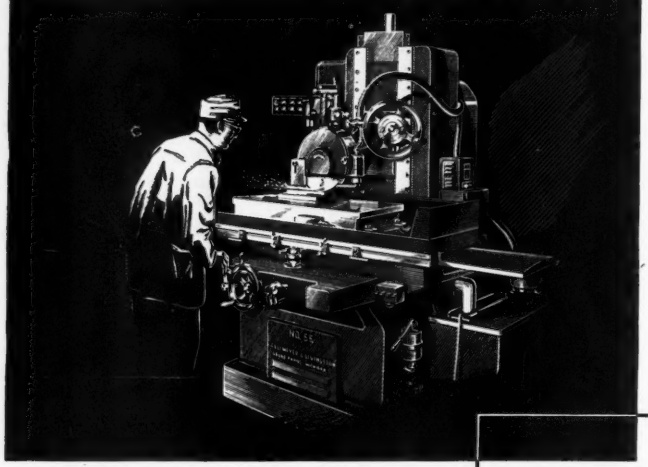
30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

WHEN THE DECISION IS PRECISION...



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids.*

Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay. As always we'll do our best to serve you.

GALLMEYER & LIVINGSTON CO.
307 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders
—World's finest

GALLMEYER & LIVINGSTON

the reaction burns the powder bag and vaporizes the liner. Exhaust gases flow out perforations and through breech vents, preventing recoil which requires shock-absorbing equipment on recoiling weapons.

Furnace Equipment Described

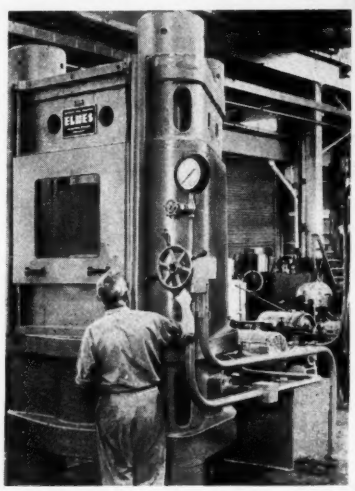
Booklet describing electrical equipment for arc furnaces is available from Westinghouse Electric Corp., Pittsburgh. The publication discusses use of equipment in both direct and submerged arc furnaces, for applications in steel mills, chemical plants, foundries, etc.

Installations described in the booklet in addition to Optimelt arc furnace control, include circuit breakers, transformers, furnace regulators, and control panels. To obtain copies, request B-4695 from the company, Box 2099, Pittsburgh 30, Pa.

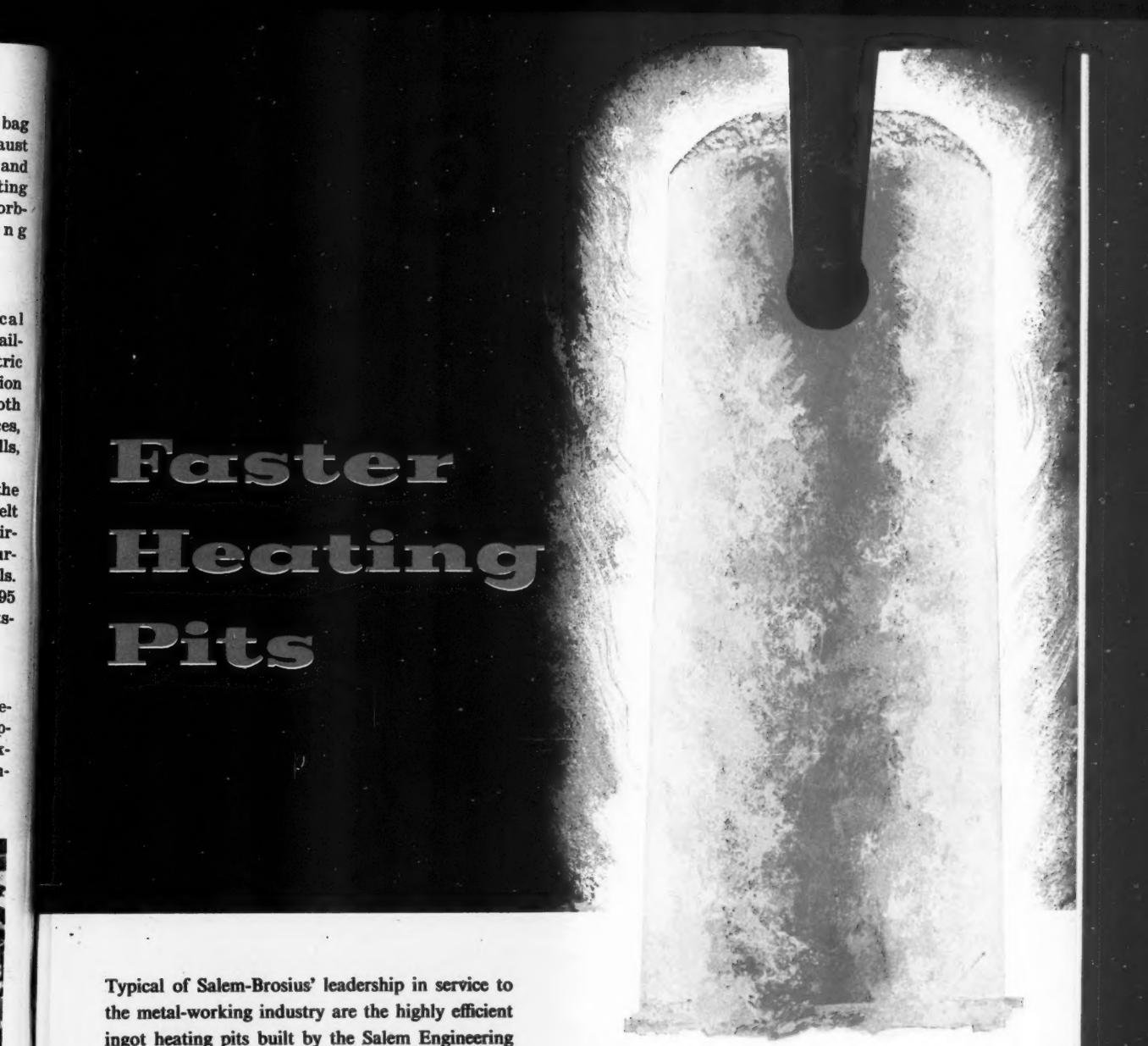
Air Conditioned Switchrooms

Specialized air conditioning requirements of telephone dial equipment switchrooms are met by packaged air conditioning units contain-

Press Used for Die Quenching



DESIGNED for a manufacturer of aircraft turbine engines and accessories, this large Elmes hydraulic hobbing press has a 2500-ton capacity. Elmes Engineering Division, American Steel Foundries, Cincinnati, manufacturer, reports press is to be used primarily for die quenching. Operation involves a quick-cooling of hot forgings while restrained in a die under extremely high pressure, thereby maintaining maximum accuracy



Faster Heating Pits

Typical of Salem-Brosius' leadership in service to the metal-working industry are the highly efficient ingot heating pits built by the Salem Engineering Division. These pit-type furnaces are well-known for rapid, uniform and accurate heating, easy operation, economy, great durability, and reduced scale loss. If you have a problem which involves the use of heating furnaces, blast furnace equipment, or charging and manipulating machines, it will pay you to call on highly experienced and diversified Salem-Brosius today.

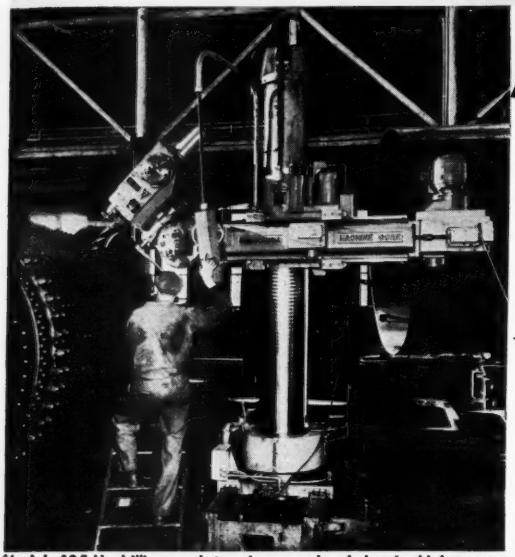
SALEM-BROSIUS, INC.

SALEM ENGINEERING DIVISION, SALEM, OHIO

BROSIUS DIVISION, PITTSBURGH 15, PA.

Kaukauna DRILLING and TAPPING Machines

UNIVERSAL AND HORIZONTAL

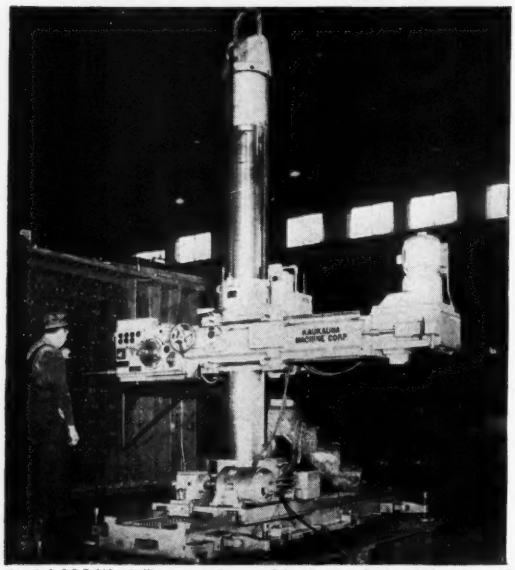


Model 125-U drilling and tapping angular holes in high pressure vessels using a 2¾" drill and a 2½" pipe tap.

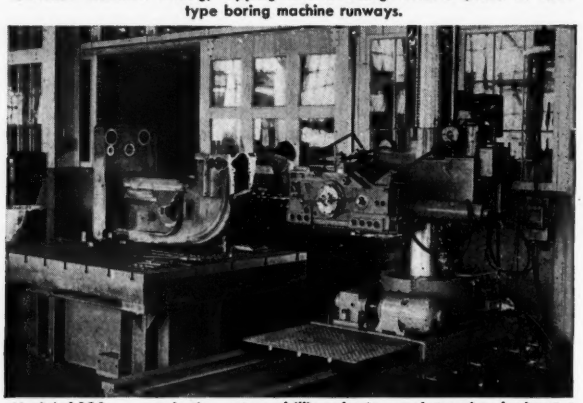
PROFIT FROM ANGULAR, VERTICAL AND HORIZONTAL OPERATIONS WITH 1 SETUP

Almost any casting or weldment—of almost any size and shape—can be drilled, tapped or spot-faced in any location accurately, quickly and easily with a KAUKAUNA Machine. Furnished with Universal Head with compound swivels, Tilting Head or Horizontal Head, all with 360° column swivel. Horizontal traverse on runway and vertical traverse on column to suit requirements. For portable or fixed location use.

Universal Machine drilling, tapping and doweling racks in place on floor type boring machine runways.



Model 125-HR drilling, reaming and back spot facing holes in a 40 cu. yd. bucket.



Model 1030 on production setup, drilling, boring and tapping horizontal holes in milling machine bases, columns, headstocks and tables.

Cut your costs on setup time, crane time, fixturing and machine hours. *Write for Catalog.*

KMC

Kaukauna MACHINE CORPORATION

KAUKAUNA, WISCONSIN, U. S. A.

ing built-in evaporative condensers, reports United States Air Conditioning Corp., Minneapolis. The company installed its refrigerated Kooler-aire equipment in four New York Telephone Co. offices.

Units provide summer dehumidification and have spray-type humidifiers for winter. This provides optimum operating conditions for the dial equipment, certain types of which are affected adversely by high or low relative humidity. Since freedom from dust is vital to proper switchroom operation, the filtering action of the air conditioning system is also of major importance.

Each unit is placed in a special equipment room and connected to the switchroom through a duct system. Compactness of packaged equipment makes it particularly suitable for this application since space is at a premium. Its built-in evaporative condenser meets local water conservation requirements without need for separate cooling towers or other devices that take additional space and special pumping and piping systems.

High Frequencies Speed Plating

Flow brightening tin plate is speeded by induction preheating with high frequency rotating equipment. So says William T. Thomas, General Electric Co., in a paper presented at the winter general meeting of American Institute of Electrical Engineers in New York.

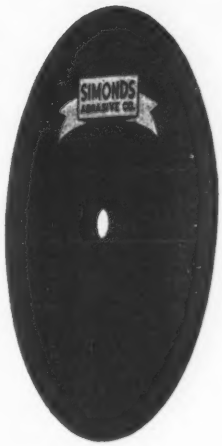
Mr. Thomas cites speeds of 1400 fpm—being extended to 2000 fpm—attained by the preheating method and compares with this an approximate maximum line speed of 600 fpm by resistance welding. He adds that 9600 cycles can be used most effectively as power for heating electrolytic plate because of 45 per cent less initial cost; lower maintenance, without tube replacements; fewer insulation problems because of lower voltage power; and increased oscillator tube life. The latter is gained by reducing peak operating oscillator plate voltage and plate current, and by allowing the high frequency generator to furnish some of the needed power if maximum line speed has been reached.

a cost reducing exercise

SIMONDS ABRASIVE CO.

Grinding Wheels

Trim your grinding costs! Get your department in shape for maximum output. Set-up with Simonds Grinding wheels. They're fit for the grind whether it's rough snagging, micro-inch finishing, cutting-off, shaping, polishing or sharpening . . . accurately specified in a complete line including grinding wheels, mounted wheels and points, segments and abrasive grain . . . and backed by Simonds' 60 years of 'know-how' as a major producer of grinding wheels and abrasive products. Write for free data book and name of your distributor.



SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
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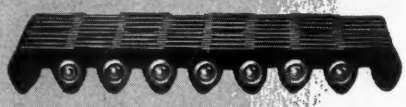
Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

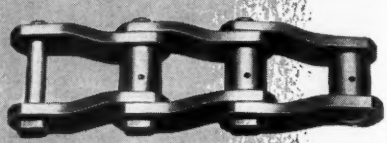
Union Chain's Performance Story PART · I

HOW UNION CHAIN SPECIALIZES

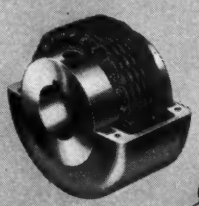
Union Chain manufactures nothing but steel sprocket chains, sprockets and attachments. Not only that—Union Chain is the only manufacturer producing every type of steel sprocket chain *exclusively*. Such specialization is the reason Union Chain consistently produces chains of the finest quality for every possible application—and it also explains why Union Chain is so often called upon to design special chains for unusual requirements.



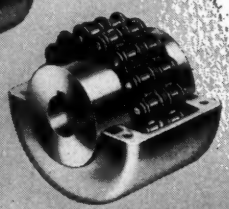
UNION SILENT CHAIN



UNION HEAVY DUTY CHAIN



UNION SILENT CHAIN FLEXIBLE COUPLING



UNION ROLLER CHAIN FLEXIBLE COUPLING

Part II - How UNION CHAIN *Manufactures*

With nothing to make but chains—with nothing to be known for but chains—Union Chain insists on meticulous accuracy in the execution of both conventional and *extra exclusively Union* manufacturing operations, thus insuring superiority of performance.

Part III - How UNION CHAIN *Recommends*

There is no need for Union Chain to recommend any chain but the right one — since Union Chain makes every type. Moreover, wide experience with every type of chain makes a recommendation from Union Chain's engineering staff a valuable one.

Part IV - How UNION CHAIN *Distributes*

Direct Factory Representatives are located in most industrial cities to provide a two-way communication service between customer and factory. See list at right—as well as list of Stock Carrying Distributors.*

*At the present time there is a heavy demand for many types of chain. Consequently, our distributors are not always in a position to fill all orders from stock.

UNION ROLLER CHAIN

FINISHED STEEL ROLLER CHAIN • SILENT CHAIN • HEAVY DRIVE AND CONVEYING CHAIN •

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Charles A. Fowler
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San Francisco 3, California

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208 Walton Bldg.
Atlanta, Georgia

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Chicago, Illinois

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Indianapolis 20, Indiana

LOUISIANA
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909 S. Jefferson Davis Pkwy.
New Orleans 15, Louisiana

MASSACHUSETTS
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Stanley Johnson
6 Hartford St.
Newton Highlands 61, Mass.

MICHIGAN
Union Chain & Mfg. Co.
W. J. White
Basso Bldg.
7338 Woodward Ave.
Detroit 2, Michigan

MINNESOTA
F. H. Bathke
490 N. Snelling Ave.
St. Paul, Minnesota

MISSOURI
J. B. Flaherty
5473 Delmar Blvd., Rm 206
St. Louis, Missouri

Ed Schiefelbein
311 West 10th St.
Kansas City 6, Missouri

NEW YORK
John B. Foley
107 Tully St.
Syracuse, New York

Mayo & Gleason, Inc.
90 Church St.
New York 7, New York

Potter & Dugan, Inc.
29 Wilkeson St.
Buffalo, New York

NORTH CAROLINA
M. B. Snyder Co.
304 E. Tremont Ave.
P. O. Box 3341
Charlotte 3, N. Carolina

OHIO
Fred W. Barrow
2925 Portsmouth Ave.
Cincinnati, Ohio

Union Chain & Mfg. Co.
F. H. Dalrymple
F. Smiley
Marshall Bldg.
Cleveland 13, Ohio

OREGON
J. W. Minder Chain & Gear Co.
307 S. E. Hawthorne Blvd.
Portland 14, Oregon

PENNSYLVANIA
David Davies
P. O. Box 4
Plymouth, Pennsylvania

Wayne Ritter
3031 W. Liberty Ave.
Pittsburgh 16, Pennsylvania

Union Chain & Mfg. Co.
John A. Shoemaker
Room 521
Schaff Bldg.
Philadelphia 2, Pennsylvania

TEXAS
Union Chain & Mfg. Co.
J. H. Castleberry
E. T. Teel
203 Irvin-Kessler Bldg.
Dallas 1, Texas

VIRGINIA
C. Arthur Weaver Co.
403 E. Franklin St.
Richmond 19, Virginia

WISCONSIN
Union Chain & Mfg. Co.
Room 508
Wisconsin Tower Bldg.
606 W. Wisconsin Ave.
Milwaukee 3, Wisconsin

SPECIAL Representatives

NEW YORK
Frank L. Allen, Inc.
50 Church Street
New York 7, New York

E. F. Graham
500 Fifth Ave.
New York, New York

OREGON
W. D. Hollingsworth
Room 400 Concord Bldg.
208 S. W. Stark St.
Portland 4, Oregon

UNION CHAIN STOCK CARRYING DISTRIBUTORS

ALABAMA
Alabama Bearing Company, Inc.
182 E. Jefferson St.
Montgomery, Alabama

Alabama Machinery & Supply Co.
Dothan, Alabama

Mill & Mine Supply Company
124 S. 20th Street
Birmingham, Alabama

ARKANSAS
Service Supply Company, Inc.
20 North University Street
P.O. Box 145, University Station
Fayetteville, Arkansas

CALIFORNIA
American Chain & Gear Co.
5511 Pacific Blvd.
Huntington Park, California

Charles A. Fowler
889 Bryant St.
San Francisco 3, California

Valley Belting & Equipment Co.
2309 Los Angeles St.
Fresno, California

CONNECTICUT
Ideal Machinery Company
Plainville, Connecticut

Motor Equipment Co.
Well & Water Sts.
Bridgeport 3, Connecticut

DELAWARE
The Briggs Rubber Products Co.
Wilmington, Delaware

Standard Industrial Supply Co.
403 Adams St.
Wilmington, Delaware

FLORIDA
Ellis & Lowe Co., Inc.
202-306 S. Morgan St.
Tampa, Florida

Farquhar Machy. Co.
720 West Bay St.
Jacksonville, Florida

General Equipment & Supply Co.
543 N. W. 5th Street
P.O. Box 1470
Miami, Florida

Industrial Marine Supply Co.
Pensacola, Florida

GEORGIA
Bearings & Drives, Inc.
515 Arch Street
Macon, Georgia

Georgia Hardware & Supply Co.
307 N. Washington St.
Albany, Georgia

Jim Horne Mill Supplies
Shellman, Georgia

Macon Supply Co.
Macon, Georgia

Phillips Hardware & Supply Co.
1022 Front Ave.
Columbus, Georgia

GEORGIA
Richmond Supply Co.
Augusta, Georgia

John D. Robinson Co.
13 Bay Street, West
Savannah, Georgia

J. M. Tull Metal & Supply Co.
285 Mariatta St. N. W.
Atlanta 3, Georgia

IDAHO
Western Bearings, Inc.
320 Front St.
Boise, Idaho

Western Bearings, Inc.
156 South Third St.
Pocatello, Idaho

ILLINOIS
Hagerty Bros. Co.
923 S. Washington St.
Peoria 2, Illinois

W. M. Hales
P. O. Box 65
Danville, Illinois

W. M. Hales Co.
719 S. Main St.
Hillsboro, Illinois

W. M. Hales Co.
W. Frankfort, Illinois

Mid-States Industrial Corp.
2401 Eleventh St.
Rockford, Illinois

Northern Illinois Supply Co.
Carpentersville, Illinois

INDIANA
Diamond Supply Co., Inc.
616-24 N. W. Second St.
Evansville, Indiana

Sherer Electric Co.
940 S. West Street
Indianapolis 25, Indiana

The South Bend Supply Co.
South Bend, Indiana

KANSAS
Bearing Service Co.
341 N. St. Francis Ave.
Wichita 2, Kansas

W. A. Thomas Supply Co.
112-114 West Third St.
Pittsburg, Kansas

KENTUCKY
Ernest Hardware & Supply Co.
829 National Ave.
Lexington, Kentucky

Sherman Bros. Mill Supply
222 South Shelby St.
Louisville 2, Kentucky

LOUISIANA
Behring's Bearing Service, Inc.
Lake Carles, Louisiana

Dixie Bearing & Supply Co., Inc.
733 N. 21st St.
Baton Rouge, Louisiana

Weeks Supply Co., Ltd.
Monroe, Louisiana

Woodward Wight & Co., Ltd.
New Orleans, Louisiana

MARYLAND
Hagerstown Equipment Co.
Maryland Ave. & Memorial Blvd.
Hagerstown, Maryland

M. F. Holland Co.
Lee & Sharp Sts.
Baltimore, Maryland

MASSACHUSETTS
Bellamy-Rabie, Inc.
45 Main St.
Cambridge, Massachusetts

Babcock Equipment Co.
163 Highland Ave.
Needham Heights 94, Mass.

MICHIGAN
Abrasive Supply Co.
821 W. Milwaukee Ave.
Detroit, Michigan

MINNESOTA
Iron Range Equipment Co.
490 N. Snelling Ave.
St. Paul, Minnesota

Jurgens Company
519 Cleveland Ave.
St. Paul 4, Minnesota

MISSOURI
Bonne Terre Farming & Cattle Co.
Bonne Terre, Missouri

Industrial Equipment Corp.
325 E. Walnut St.
Springfield, Missouri

Te-Co, Inc.
801-805 N. Second St.
St. Louis, Missouri

Wildhagen Machine & Supply Co.
224 S. Third St.
St. Joseph 5, Missouri

MONTANA
Western Foundry Co.
802 Toole Ave.
Missoula, Montana

NEW JERSEY
Burton Supply Co.
165 Park Ave.
Paterson, New Jersey

Mill Supply & Hardware Co.
285-289 N. Willow St.
Trenton 4, New Jersey

Old Reliable Supply & Equipment Co.
11th St. & Newton Ave.
Camden, New Jersey

NEW MEXICO
Union Industrial Corporation
112 East Mermod St.
Carlsbad, New Mexico

NEW YORK
Laurence Belting Co.
111 Chambers St.
New York, New York

S. H. Pooley Belting Co.
38 W. Seneca Street
Buffalo 2, New York

Transmatic Equipment Co.
11 North Pearl St.
Albany, New York

U. & S. Inc.
Lincoln Bank Bldg.
509 S. W. Street
Syracuse, New York

Ulster Foundry Corp.
20 St. James St.
Kingston, New York

NORTH CAROLINA
Piedmont Mill Supply Co.
P. O. Box 130
Salisbury, N. Carolina

OHIO
Brubaker Gear & Mfg. Co.
Barberton, Ohio

Cincinnati Transmission Co.
3330 Montgomery Road
Cincinnati 7, Ohio

C. J. Edwards Company
6408 Euclid Ave.
Cleveland 3, Ohio

Lima Armature Works, Inc.
440 N. Main St.
Lima, Ohio

Mill & Factory Supply Co.
317–10th St.
Toledo, Ohio

Wilkof Hardware & Supply Company
1100 Warner Road, S. E.
Canton, Ohio

Winkle Electric Co., Inc.
701 Andrews Avenue
Youngstown 2, Ohio

OKLAHOMA
C. F. Dagwell & Company
816 W. Main St.
Oklahoma City, Oklahoma

Ore Reclamation Company
201 N. Connell Ave.
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Electric Steel Foundry
Eugene, Oregon

Fisher Bros. Company
522 Bond Street
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Industrial Machinery & Supply Co.
1410 Adams Avenue
La Grande, Oregon

Industrial Steel & Supply Co.
North Bend, Oregon

J. W. Minder Chain & Gear Co.
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Portland 14, Oregon

PENNSYLVANIA
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1330 Federal Street
Philadelphia, Pennsylvania

S. S. Bronner
2303 E. Philadelphia Street
York, Pennsylvania

Clark Materials Handling Equipment Co.
1407 Derry Street
Harrisburg, Pennsylvania

Industrial Supply Co.
451 E. Broad St.
Hazleton, Pennsylvania

Keystone Bearing & Supply Co.
Second and Hamilton Sts.
Allentown, Pennsylvania

Maximow Machine Co.
801 N. Logan Blvd.
Altoona, Pennsylvania

Reilly Bros. & Raub
44 N. Queen St.
Lancaster, Pennsylvania

Sherwin Bearing Co.
1120 Wyoming Avenue
Scranton 1, Pennsylvania

Transmission Equipment Co.
903 E. Carson St.
Pittsburgh 10, Pennsylvania

SOUTH CAROLINA
Crawford & Garner, Inc.
P. O. Box 1839
Spartanburg, S. Carolina

O'Brien Dehnam Company
213 E. Evans St.
Florence, S. Carolina

Southern Mill Supply Co.
Summerville, S. Carolina

Thackston-Davis Supply Co.
828 Gervais Street
Columbia, S. Carolina

TENNESSEE
Hoyt N. Payne Co.
P.O. Box 943
410 E. Depot Ave.
Knoxville, Tennessee

Tennessee Machinery Co.
114-119 Third Ave., South
Nashville 3, Tennessee

Tipps Engineering & Supply Co., Inc.
260 N. Front St.
Memphis, Tennessee

TEXAS
Allied Belting & Trans. Co
2614 Sylvan Ave.
Dallas, Texas

Beacon Supply Co., Inc.
1825 Washington Ave.
Houston 10, Texas

Bearing Specialists Co.
2902 Texas
Lubbock, Texas

El Paso Machine Works, Inc.
1600 E. 4th St.
El Paso, Texas

Great Western Supply Co.
14th & Throckmorton
Fort Worth, Texas

E. B. Hayes Machinery Co.
Marshall, Texas

Lloyd Electric Co.
311 El Paso St.
San Antonio, Texas

Overton & Mims, Inc.
1309 Indiana
Wichita Falls, Texas

VIRGINIA
Blue Ridge Hardware & Supply Co.
Bassett, Virginia

Mill Supplies Corp.
South Norfolk, Virginia

WASHINGTON
Electric Steel Foundry
1327 Washington St.
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WEST VIRGINIA
Park Engineering Sales Co.
2391 Dudley St.
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Bluefield Hardware Co.
Bluefield, W. Virginia

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150 Peninsula St.
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The Union Chain and Manufacturing Company • Sandusky, Ohio, U.S.A.

ATTACHMENTS • SPROCKETS • FLEXIBLE COUPLINGS • FOR ALL INDUSTRIES

CALENDAR
OF MEETINGS

†Denotes first listing in this column.

February 11-15, National Sand & Gravel Association: Biennial meeting, Hotel Conrad Hilton, Chicago. Association address: 1325 E St, NW, Washington 4. Executive secretary: Vincent P. Ahearn.

February 12, Chamber of Commerce of the United States: National conference on labor relations, Pittsburgh. Chamber address: 1615 H St, NW, Washington 6. Executive vice president: Arch N. Booth.

February 14-15, Foundry Educational Foundation: Technical and university advisory committees conference, Hotel Statler, Cleveland. Foundation address: Terminal Tower, Cleveland 13.

February 15, Eastern States Blast Furnace & Coke Oven Association: Annual winter meeting, Hotel William Penn, Pittsburgh. Secretary: Benjamin B. Frost, Arthur G. McKee & Co., Cleveland.

February 16-21, Automotive Electric Association: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 800 Michigan Bldg., Detroit 26. Secretary: S. W. Potter.

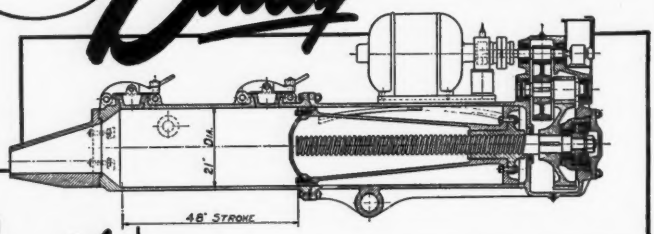
February 18-19, National Association of Aluminum Distributors: First annual meeting, Hotel Drake, Chicago. Association address: 905 Midland Bldg., Cleveland 13. Executive Secretary: Raymond L. Collier.

February 18-20, National Crushed Stone Association: Annual meeting, Hotel Conrad Hilton, Chicago. Association address: 1415 Elliot Place NW, Washington 7. Administrative director: J. R. Boyd.

February 18-20, American Management Association: Personnel conference, Palmer House, Chicago. Association address: 33 W 42nd St., New York.

Long and Uniform Tapping Holes

Bailey CLAY GUN



Powerful

A powerful electrically-driven piston assures unfailing performance.

Best results and safety in plugging blast furnace tapping holes are obtained with the Bailey Clay Gun. The special Bailey Lever Action forces the nose of the gun forward with positive accuracy. A powerful, motor-driven screw provides the piston pressure necessary to maintain long tapping holes.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA.

February 18-21, American Institute of Mining & Metallurgical Engineers: Annual meeting, Hotel Statler, New York. Institute address: 29 W. 39th St., New York. Secretary: Edward H. Robie.

February 21-22, Society of the Plastics Industry (of Canada) Ltd.: Annual conference, Royal York Hotel, Toronto. Society address: 67 W. 44th St., New York 18. Executive vice president: William T. Cruse.

February 25-26, Materials Handling Conference: Purdue University, sponsor. Address: W. Lafayette, Ind.

February 25-28, Industrial Ventilation Conference: School of Engineering, Michigan State College, E. Lansing, Mich. Secretary: K. E. Robinson, Division of Industrial Health, Michigan Dept. of Health, Lansing, Mich.

February 28, Bituminous Coal Research Inc.: Annual meeting and exhibit, Edgewater Beach Hotel, Chicago. Address: 804 Southern Bldg., Washington 5. Secretary: C. A. Reed.

March 3-7, American Society for Testing Materials: Spring meeting & committee week, Hotel Statler, Cleveland. Society address: 1916 Race St., Philadelphia. Secretary: C. L. Warwick.

March 4-6, Society of Automotive Engineers: National passenger car, body and materials meeting, Hotel Book Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

†March 5, Manufacturers Standardization Society of the Valve & Fittings Industry: Annual meeting, Hotel Commodore, New York. Society address: 420 Lexington Ave., New York 17. Secretary: Lester W. Benoit.

†March 5, Steel Kitchen Cabinet Manufacturers Association Inc.: Quarterly meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

March 10-14, National Electrical Manufacturers Association: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 10-14, National Association of Corrosion Engineers: Annual conference and exhibit, Hotels Buccaneer and Galvez and Galveston Municipal Pier, Galveston, Tex. Association address: 919 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

†March 11-14, Society of the Plastics Industry Inc.: National Plastics Exposition, Convention Hall, Philadelphia. Society address: 67 W. 44th St., New York 18. Executive vice president: William T. Cruse.

†March 12-14, American Society of Training Directors: Annual conference, French Lick Hotel, French Lick Springs, Ind. Secretary: R. L. Moberly, University of Wisconsin, Madison, Wis.

†March 16-19, American Institute of Chemical Engineers: Annual spring conference, Biltmore Hotel, Atlanta. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

†March 17-19, Midwest Conference on Fluid Mechanics: Ohio State University, Columbus, O. General conference chairman: Prof. A. N. Tifford, aeronautical engineering department, Ohio State University.

†March 17-19, National Association of Waste Material Dealers Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 271 Madison Ave., New York. Secretary: Clinton M. White.

March 17-21, American Society of Tool Engineers: Annual meeting and biennial industrial exposition, International Amphitheater, Chicago. Society address: 10700 Puritan Ave., Detroit. Secretary: Harry Conrad.

†March 18-19, Steel Founders' Society of America: Annual meeting, Edgewater Beach Hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

†March 20-21, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 13210 Shaker Square, Cleveland 20. Manager: Orrin B. Wernts.

†March 21, Material Handling Institute: Edgewater Beach Hotel, Chicago. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

The hard, cold facts about Pittsburgh's hot furnaces!

47 PLANTS OKAY THE HEAT PROVER

Pittsburgh's great steel industry needed an instrument to measure air infiltration, to check air requirement and fuel-air ratio controls in open-hearth furnaces . . . an instrument to check the stoves in which blast-furnace air is heated . . . to check precise atmospheres in soaking pits . . . to control fuel waste and precise atmospheres in processing furnaces.

THE CITIES SERVICE HEAT PROVER WAS THE ANSWER . . . and it received the stamp of approval from engineers in 47 different mills in and around Pittsburgh!

Cities Service Heat Provers . . . *not an instrument you buy, but a service we supply* . . . helped to boost furnace productivity through these five unique advantages:

1. Rapid continuous sampling.

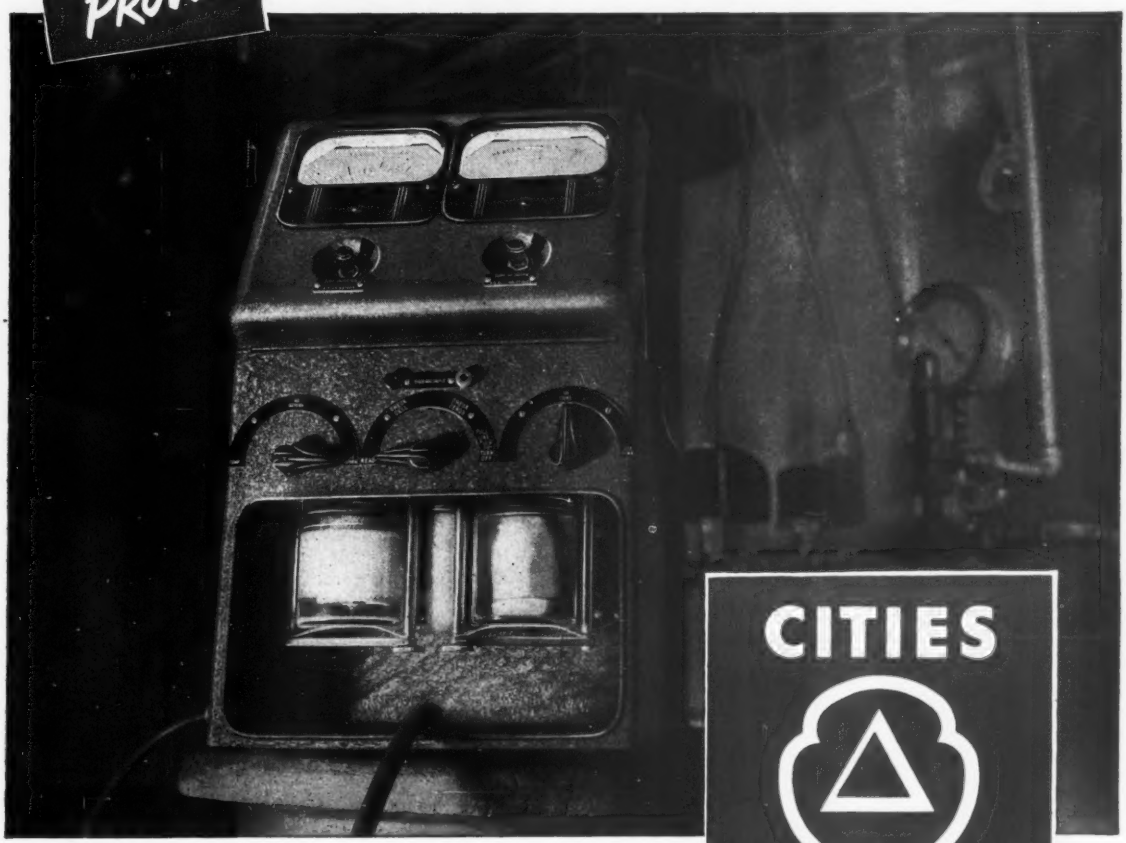
2. Simultaneous reading of oxygen and combustibles.

3. Direct measurement of oxygen and combustibles.

4. Easy portability.

5. No maintenance; no re-calibration.

These points begin to tell you why Cities Service Heat Prover analyses are just as much favored in glass, ceramics, steam generation and other fields as in the great Pittsburgh steel area. For the full story as it applies to you, write CITIES SERVICE OIL COMPANY, Dept. B24, Sixty Wall Tower, New York City 5.



Introducing "HG" and "Jr."

"HG" is the "guy" who looks after "Jr." "HG" (Hanlon-Gregory) will protect your iron and steel for you just as well.

Follow the episodes of "HG" and "Jr." in this publication.

If it's made of iron or steel, and exposed to the elements, remember to have it Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania

The World's Largest Job Galvanizing Plant

A. J. DIEBOLD, President

in the heart of the STEEL INDUSTRY

HOT DIP

galvanizing . . . . pickling . . . . painting . . . . oiling

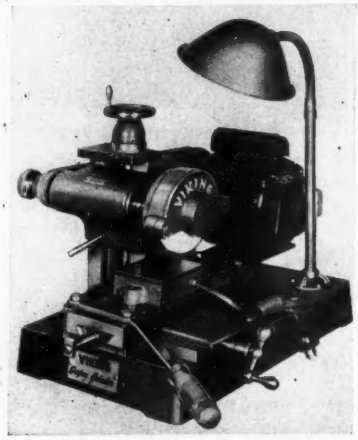
New Products and Equipment

Bench-Type Surface Grinder

USE REPLY CARD—CIRCLE No. 1

Viking Industries, Rockford, Ill., offers a bench-type precision surface grinder with heavy duty, ball bearing spindle made for fast, accurate work on small parts. Machine has heavy head stock, micrometer adjusting dials and includes as standard equipment the company's compact magnetic chuck. Powered by a 1/3-hp continuous dual-voltage motor, the grinder mounts a 4-inch diameter wheel. A No. 7 Brown & Sharpe taper is standard.

Table is mounted on dove-tail way, quickly traversed by hand lever. Micrometer dials for vertical and cross feed adjustments are graduated in 0.001-inch to permit fine settings. Base size is 11 x 18 inches; table working surface is 9½ x 6 inches. Magnetic chuck has 3⅝ x 3⅛-inch surface and overall height of 1 5/16-inch. Unit with switch for demagnetizing is optional.



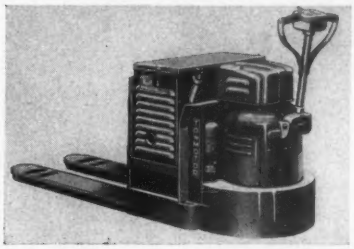
. . . made for precision work on small parts

Truck Has Built-in Generator

USE REPLY CARD—CIRCLE No. 2

Gasoline powered generator that supplies constant voltage for continuous operation of its model W electric pallet truck is a development of Towmotor Corp., 1236 E. 152nd St., Cleveland, O. For use when materials must be handled without interruption over long periods, the built-in generator needs no recharging. It operates without conventional electric storage batteries.

Direct current generator is mounted as an integral part of the small industrial gasoline engine. Fuel tank, starting battery and all other accessories are enclosed in the unit's steel housing. To run the truck with Ready-Power installation, operator turns ignition key and presses starter to get immediate power.



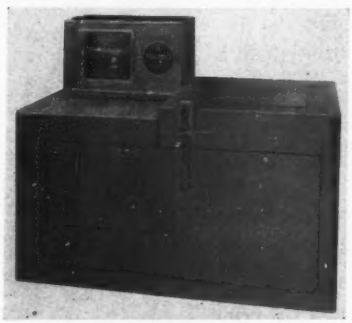
. . . constant power for continuous handling

High Speed Classifying Scale

USE REPLY CARD—CIRCLE No. 3

High-speed, fully automatic scale for simultaneous classifying, zoning and check weighing is introduced by Toledo Scale Co., Toledo, O. Called the Electronic Dynamic Classifier, the unit is suited for check weighing prefilled containers. It can also be used to classify finished products into various weight groups or zones.

Scale is custom built to meet specific needs of a designated job. Designed to handle weights in the 4-ounce to 10-pound range, it processes containers into a maximum of eight different zones. It is accurate to 2/10 of 1 per cent of the object's weight, classifies articles at speeds of 60 to 100 per minute depending on article's size.



. . . for check-weighing filled containers

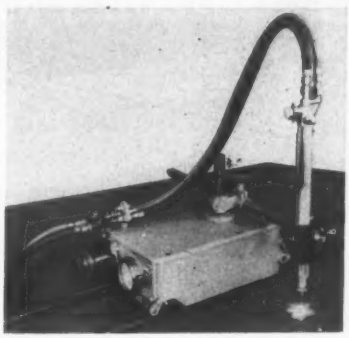
REPLY CARDS

on page 145 will bring you more information on any new products and equipment in this section.

Gas Cutter Is Track Guided

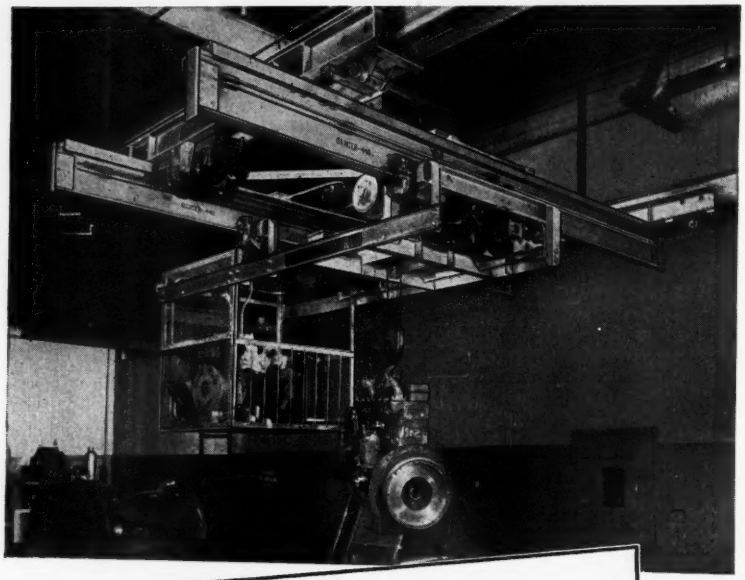
USE REPLY CARD—CIRCLE No. 4

Gas cutting machine, the Airco No. 20 Radiagraph, is introduced by Air Reduction Sales Co., division of Air Reduction Co. Inc., 60 E. 42nd St., New York 17, N. Y. Cutter is designed specifically to be used as a traveling carriage for mounting such equipment as the company's Aircomatic machine, Heliweld machine holder and filler wire feeder. In addition it fulfills requirements of a portable, motor-driven, straight track-guided cutter. Transmission is a self-contained unit, while the entire operating mechanism is mounted as a unit with all internal parts easily accessible.



. . . designed for use as traveling carriage

Travel speeds in the low range are 2 to 12 inches per minute; in the high range, 10 to 60 inches per minute. Length of travel with 6-foot, 4-inch interlocking track is approximately 5 feet, 3 inches. Easily portable, the machine



here's the crane for . . .

CONSTANT SERVICE at HIGH SPEED

If your handling operations must be "on the go—all the time—and fast" then investigate this American MonoRail Crane. With constant service at high speed, it offers the advantages of rugged construction, low-cost operation and quick installation.

The big reason is articulated trolleys. Each trolley wheel carries its share of the load in perfect alignment with the craneway tracks. All possible friction is eliminated. The result is perfectly articulated trolley travel. Articulated trolleys permit operating speeds of 500 feet per minute under constant service.

SEND FOR BULLETIN C-1

THE AMERICAN MONORAIL COMPANY

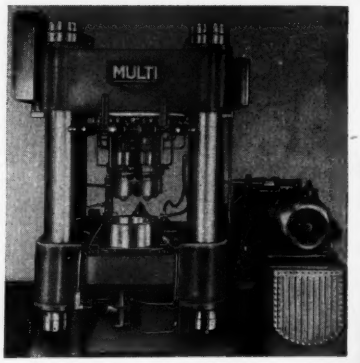
13102 ATHENS AVENUE ● CLEVELAND 7, OHIO

weighs only 57 pounds without accessories.

Press Assembles Studs to Hubs

USE REPLY CARD—CIRCLE No. 5

Automatic, hydraulically actuated 300-ton press for assembling serrated studs to hubs is introduced by Multi-Hydromatic Welding & Mfg. Co., 23171 Groesbeck Highway, E. Detroit, Mich. In operation, the fixture loads in out



. . . weighs 300 tons; hydraulically actuated

position, then moves under ram where five studs are pressed into hubs. After indexing, the remaining five studs are pressed in and fixture moves out. The piece is ejected automatically. Press design includes a large-capacity hydraulic power unit, oil cooler and two-stage pump.

Compressor Tests Small Parts

USE REPLY CARD—CIRCLE No. 6

Rapid, accurate compression and crushing tests for many types of small parts can be made with a lightweight, portable hydraulic machine introduced by Labquip Corp., 4520 W. North Ave., Chicago 39, Ill. Machine is an industrial adaptation of apparatus used previously in engineering soil testing. Load to the test specimen is applied through a hydraulic system actuated by compressed air. Unit is ready for testing without need for warm-up period when connected to an air source.

Load applied is indicated on the dial of a double proving ring. This type ring means low range accuracy in tests that involve large loads and eliminates changing rings for different tests. To keep the specimen intact, load can be released in-

Van Huffel
cold-formed metal tubing
and shapes solve problems
for the makers
of

farm equipment

It may be a far cry from vegetables to Van Huffel, but farm equipment manufacturers will tell you they are both basic in the scheme of things.

For instance, where deadweight must be cut from a tractor without sacrificing strength . . . where a farm implement must be easier to carry, move or lift without complicated fabrication . . . a lot of production problems are being solved by the versatility of Van Huffel metal shapes and tubing.

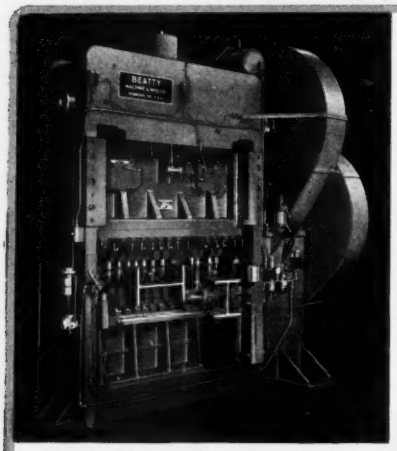
VAN HUFFEL

TUBE CORPORATION • WARREN, OHIO

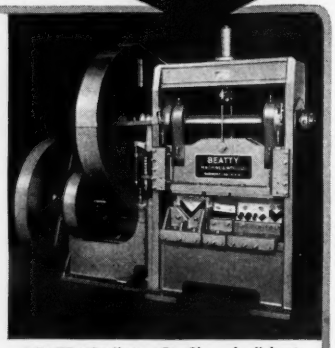
WELDED, LOCK SEAM, OPEN SEAM, BUTTED TUBING, SHAPES AND MOULDINGS

Here are Six Answers to

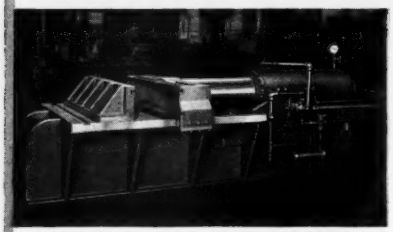
SIX HEAVY METAL WORKING PROBLEMS



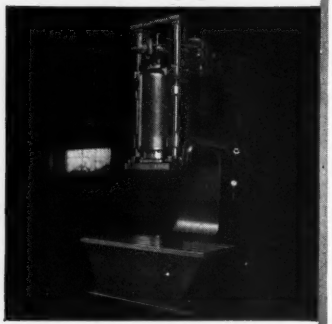
BEATTY No. 9 Guillotine Beam Punch for flange and web punching of beams up to 30".



BEATTY Guillotine Bar Shear for "short-order" shearing of flats, squares, rounds without changing tools.

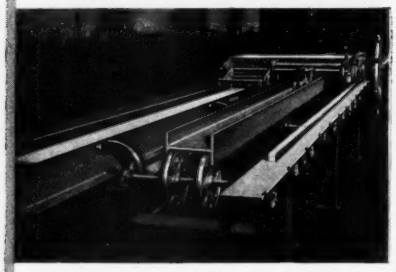


BEATTY Horizontal Hydraulic Bull-dozer for heavy forming, flanging and bending.

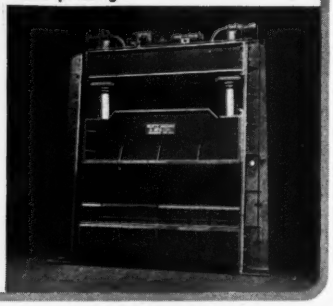


BEATTY 250-ton Gap Type Press for forming, bending, flanging and press-ing.

Below: BEATTY 400-ton Hydraulic Vertical Bulldozer for heavy forming and pressing.



BEATTY Spacing Table handles flange and web punching of beams without roll adjustment.



BEATTY
Machine & Mfg. Co.
•
Hammond, Indiana

Fast, low-cost production demands machines correctly designed, correctly tooled for the job to be done. Our broad experience in the design of heavy metal working machines qualifies us to make valuable recommendations. Let us give you details and an estimate on the cost of a Beatty machine tailored to your specific needs.

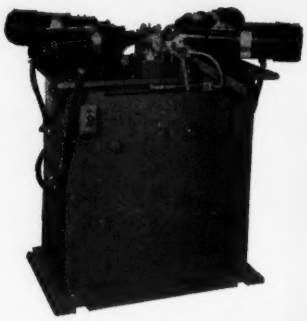
stantly at any time during the test or at point of failure.

Standard model has 350-pound capacity under operating air pressure of 100 psi. Machines with capacities to 1000 pounds can be made on order.

Machine Drills Brass Balls

USE REPLY CARD—CIRCLE No. 7

Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich., introduces a machine designed to drill five spots simultaneously on a small brass ball. Machine incorporates four of the company's model KH drilling units mounted horizontally to drill four spots 0.140-inch in diameter. One unit is mounted vertically, drilling an 0.154-inch diameter hole from the bottom.



. . . completes five spots in 4-second cycle

Operator loads the parts manually. When drilling is complete, holder unclamps automatically and ejects the part into the chute. In this setup, the five operations are completed at a rate of one part each 4 seconds, including loading and unloading time.

Industrial Vacuum Cleaner

USE REPLY CARD—CIRCLE No. 8

Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40, Ill., offers its Tornado model 92 industrial vacuum cleaner. Versatile in application, the cleaner can be used as a hand-carried blower cleaner, a portable hand vacuum cleaner for off the floor cleaning, or a portable air-sweeper. With all units attached, it is a compact universal suction cleaner for plant and office. The complete motor and fan housing is removable for use in the portable units.

Its air cooled universal 1 1/3-hp motor operates at 13,000 rpm, creating a suction of more than

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For the finest in precision quality and service Quaker now offers you something new in roll covering!

No need to pay excessive freight bills for shipping rolls great distances for recovering, regrinding or crowning. Just ship practically any type of roll to the nearest Quaker branch: Pittsburgh, New York, Cleveland, Chicago, Houston, Atlanta, Detroit, Boston, St. Louis. Quaker's fleet of fast trucks will transport these rolls, free of charge, to Philadelphia—headquarters for the finest in roll covering equipment.

Quaker's specialists in Philadelphia have been covering rolls for more than a quarter of a century and can apply covering to most any size or type of roll. Modern equipment for handling rolls from 6 inches to 36 inches in diameter . . . to 204 inches in length including journals . . . with a maximum weight of 16 tons. Rolls can be covered with crude rubber, neoprenes and other synthetic type construction from "0" P & J reading to "260" or 0-100 "A" shore durometer. Hardness and composition of your present roll covering can be matched to precise specifications by Quaker's laboratory production technicians.

For fast, economical roll covering, grinding or precise crowning service, call your nearest Quaker Rubber branch. You'll find it will save you time, production and money. Write, wire or phone for complete details on this new service.

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NEW WENDT-SONIS CATALOG No. 52

72 pages . . . illustrations and specifications on the most complete line of carbide cutting tools. Send for your copy today.

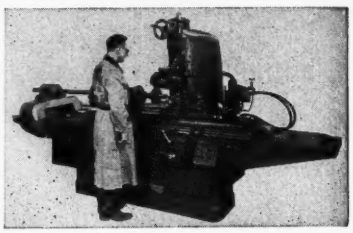
Write Wendt-Sonis Company, Hannibal, Missouri.

200 cfm. For heavy duty cleaning, it has a 12-gallon capacity tank and heavy exterior dust bag. Finished in baked enamel, the complete unit weighs 50 pounds.

Gear Grinder Uses Lead Bar

USE REPLY CARD—CIRCLE No. 9

Helical gear grinder, model SGF, is made for precision form gear grinding by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. Lead bar principle, with refinement for helical grinding, is adapted to maintain the true helix angle. Essentially it



. . . made to maintain a true helix angle

consists of an accurately ground master lead bar, operated through pressure lubricated self-tightening antibacklash saddle nut. Work drive headstock is coupled through index plate to one end of the bar. As the lead bar is reciprocated, work rotates with it.

Split saddle nut through which the bar reciprocates is supported rigidly by a bridge housing bolted to the machine base. Column is mounted on base and located by two circular slots to position wheel's plane for the desired helix angle. It can be moved easily to correct radial position by a graduated scale and semicircular chain rack and pinion, controlled by hand crank. Indexing is entirely mechanical actuated by lead bar motion.

Small Magnetic Converter

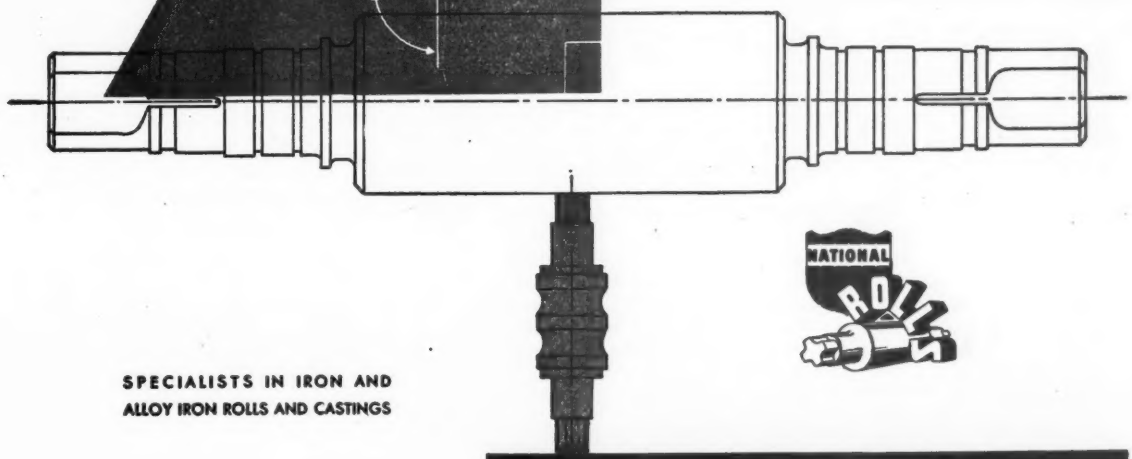
USE REPLY CARD—CIRCLE No. 10

A small magnetic converter for use in converting low level direct current error signals to alternating current voltage in a wide variety of measurements systems is announced by General Electric's Meter & Instrument Department, Schenectady 5, N. Y. It can be used wherever precise control is required from small direct current

GOT A ROLL PROBLEM?

Because of their technical knowledge of metals and metallurgy and their practical experience, our metallurgical staff has been helpful in solving many roll and rolling problems . . . And they have at their disposal modern laboratories for physical testing and research.

Why not call on them to help you solve your roll problems.



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AVONMORE, PENNSYLVANIA

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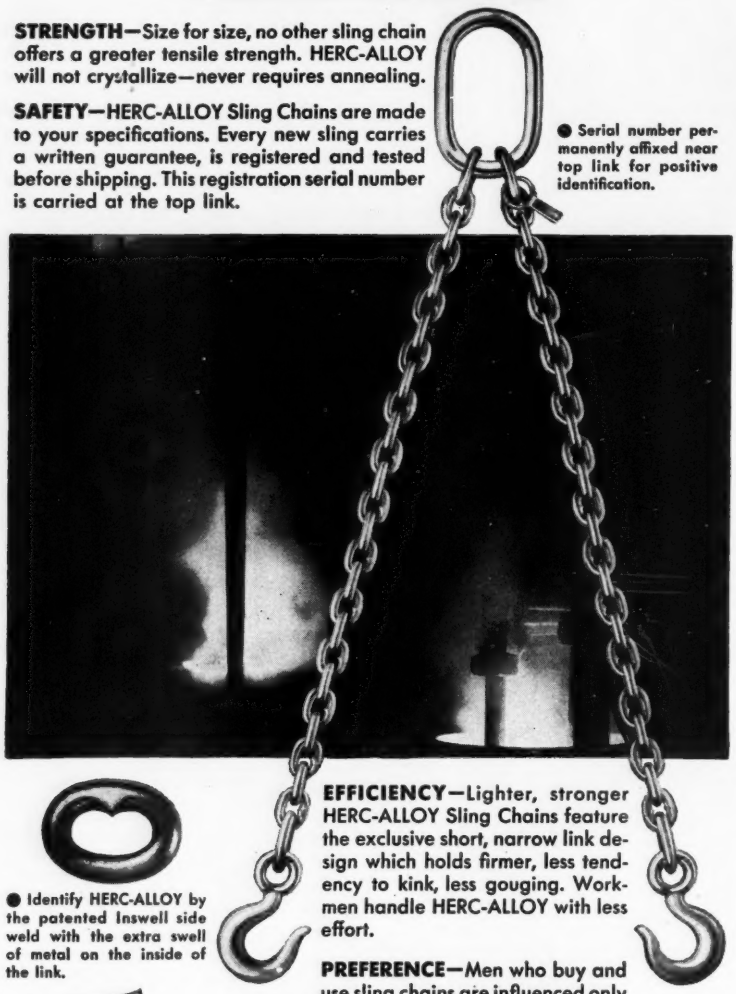
HERC-ALLOY

SLING CHAINS

STRENGTH—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

SAFETY—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.

● Serial number permanently affixed near top link for positive identification.



● Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.

EFFICIENCY—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

PREFERENCE—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

Write for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

COLUMBUS McKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corp.)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

***District Offices:* New York • Chicago • Cleveland**

Other Factories at Angola, N. Y., Dixon, Ill., St. Catharines, Ont., and Johannesburg, South Africa.

signals. Unit is hermetically sealed and can be operated under extreme conditions of temperature, pressure and humidity.

Vinyl Primer for Rusted Steel

USE REPLY CARD—CIRCLE No. 11

Tygorust, a vinyl primer developed by U. S. Stoneware Co., Akron, O., is for use on rusted steel surfaces without the necessity for previous preparation. It is applied by brushing, spraying or dipping, dries hard and can be overcoated in a matter of minutes. It adheres tenaciously to rusted steel, damp or dry.

Heat Repelling Glove

USE REPLY CARD—CIRCLE No. 12

Designed to protect hands of workers exposed to radiated heat conditions, a durable asbestos aluminum-lined reversible mitt was developed by Milburn Co., Detroit 7, Mich. Constructed of a sheet of aluminum-coated fabric between two layers of heavy asbestos, it is jersey lined, providing maximum heat resistance without causing skin irritation.

Low Magnification Strain Units

USE REPLY CARD—CIRCLE No. 13

Tinius Olsen Testing Machine Co., Willow Grove, Pa., offers a line of C-type low magnification strain instruments. Used to detect large motions of specimen deformation in tension, compression and flexure testing, instruments transmit signals by Atcotran differential transformers that rotate the recorder drum in direct proportion to the motion measured.

Tool Post Turrets

USE REPLY CARD—CIRCLE No. 14

Royal Products, Mineola, N. Y., offers a line of tool post turrets that provides 12 position indexing. Accuracy is maintained in every re-indexed position. Three models are available: 2½, 3½ and 4½ inches square.

Magnetic Die Indicator Holder

USE REPLY CARD—CIRCLE No. 15

Model 200 magnetic dial indicator holder with precision adjusting device controlling positioning of the dial holding rod is announced

NEW!
The Flexible
Norton
REINFORCED
RESINOID
Hub Wheel

Adds new speed, ease and safety to your portable grinding jobs

This new Norton BFR flexible *Reinforced* Hub Wheel is sure to step up the efficiency of your portable grinding and sanding equipment because:

It's a fast-cutting wheel . . . thanks to its sharp, durable ALUNDUM* abrasive and special resinoid bond.

It's a time-saving wheel for blending in contours and corners because it has the necessary flexibility.

It's a safe, strong wheel because it has *extra* fabric reinforcement molded into it. It holds together even if it should be accidentally cracked.

It can't be beat for cutting off small gates and risers and notching big ones, smoothing welds and contours, removing mold marks and rust prior to painting.

Team up this new Norton BFR flexible *Reinforced* Hub Wheel with the heavy-duty Norton BD semi-rigid Hub Wheel and you'll multiply the number of jobs you can profitably do with your portable grinders and sanders.

Ask your nearby Norton distributor about Norton BD and BFR *Reinforced* Hub Wheels. He's listed under "Grinding Wheels" in your classified telephone directory. Or write direct to Norton Company, Worcester 6, Mass. Distributors in all principal cities. EXPORT: Norton Behr-Manning Overseas Inc., Worcester, Mass., New Rochelle, N. Y.

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ABRASIVES
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*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

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1 3/4 D. P.

STANDARD, INVOLUTE 14½° P. A. CARRIED IN STOCK FOR QUICK DELIVERY

SPECIALS — CUTTERS FROM 1 D. P. FOR ROUGHING OR FINISHING • GANGS FOR COMBINING BOTH OPERATIONS • GROUND OR UNGROUND • STOCKING CUTTERS, STEPPED OR ALTERNATE-STEPPED TOOTH STYLE

COMPLETE GEAR CUTTING SERVICE
SEND BLUEPRINTS FOR ESTIMATES

BARBER-COLMAN COMPANY
882 ROCK STREET
ROCKFORD, ILLINOIS

by Cullen Mfg. Co., Racine, Wis. It is controlled by a thumbscrew enabling the operator to make minute adjustment of the indicator against or away from the work being checked without touching holding rod or indicator.

Proportioning Controller

USE REPLY CARD—CIRCLE No. 16

Model JP Gardsman proportioning controller, made by Taco West Corp., Chicago, Ill., automatically adjusts ratio of power on and off over a given time cycle to maintain any desired temperature set with the index pointer. It anticipates and corrects for thermal inertia by preventing control point overshooting on most installations.

For All-Directional Vibration

USE REPLY CARD—CIRCLE No. 17

A large vibrator is added to the Peterson Vibrolator line by Martin Engineering Co., Kewanee, Ill. Specified as DV 51, it gives powerful all-directional vibration that moves materials without damage to faces of hoppers or bins. It is self-starting and requires no lubrication.

Feed for Sheet Working Units

USE REPLY CARD—CIRCLE No. 18

American Pullmax Co. Inc., Chicago 14, Ill., introduces power feed for use on its Major, models P-5 and D-3 to aid in cutting and working steel plates up to 11/32-inch. The device can be used for cutting disks and circles on a production basis.

Repairs, Resurfaces Floors

USE REPLY CARD—CIRCLE No. 19

Trowel-In, developed by Flexrock Co., Philadelphia 4, Pa., repairs and resurfaces floors of practically any composition. Material does not require heat or any additional

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INFORMATION

AVAILABLE FOR THE ASKING

70. Rotary Finishing

Roto-Finish Co.—How the Roto-Finish process can put precision finishing on a mass production basis for you is told in excellent 16-page illustrated booklet "Precision Finishes Mechanically." Process mechanizes grinding, deburring, descaling, polishing, Britehoning and coloring; eliminates hand labor; cuts finishing costs and maintains exacting tolerances and uniformity of finish.

71. Radiation Instruments

General Electric Co.—With nuclear radiation playing a more important role throughout industry, you'll want a copy of 8-page illustrated bulletin GEA-5735. Features and application data are presented on radiation monitors, scintillation counters, portable radiation probe, area health monitor, thermocouple vacuum gage and many other related devices.

72. Safety Tools

Ampco Metal, Inc.—You can safeguard lives and property whenever inflammable or explosive materials are employed by using Ampco spark-resisting safety tools described in 4-page illustrated bulletin ST-5. Specs are given on wrenches, scrapers, knives, screwdrivers, hammers, shovels, pliers and other tools.

73. Cylindrical Grinders

A. Harold Frauenthal, Inc.—If you require precision grinding of parts 24 to 140 in. in diameter you'll find basic information on line of multiple-head cylindrical grinders in 4-page illustrated folder. Grinders are built in ten sizes, ranging from 140 in. down to 30-in. table sizes. Accuracy tolerances are down to 0.0002-in.

74. Big Enclosed Motors

Allis-Chalmers Mfg. Co.—Illustrated bulletin 51B7149B explains construction and applications of totally-enclosed fan-cooled motors with tube-type air-to-air heat exchangers in ratings from 40 hp at 600 rpm through 800 hp at 3600 rpm. Standard and explosionproof designs meet needs of practically any service condition.

75. Inclinable Power Presses

Clearing Machine Corp.—Here is an informative 16-page bulletin, No. 215, containing full illustration and description of open back inclinable nongeared and geared power presses. Cutaway pictures and dimensional drawings show important design features of presses ranging from 30 to 200 tons capacity and adaptable to blanking, forming, drawing and assembly operations.

76. Tap Changing Equipment

Pennsylvania Transformer Co. — "Pennsylvania Underload Tap Changing Equipment" is title of catalog No. 5112 which covers equipment for single circuit unit substations in all sizes and voltages, step voltage regulators in voltages up to 750 kva and load ratio control transformers in all voltages up to 7500 kva. Many illustrations and diagrams are in the 16-pages.

77. Multiple Station Alarms

Automatic Control Co.—Autocon Multalarms which signal emergency conditions of liquid level, pressure, temperature, smoke, gas, etc. are subject of illustrated bulletin 7411. Alarm features automatic reset that provides continuous visual indication until emergency condition is corrected.

78. Thermocouple Glands

Conax Corp.—The inside story of bare wire thermocouple glands is told in 4-page bulletin 951. Drawing shows internal construction along with illustration of various types and tabulated specifications. Glands find application in temperature measurement of gases, vapors or liquids in closed chambers. They are used in heat ranges from ambient to over 1500°F.

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79. Cylindrical Grinders

Landis Tool Co.—Simplified operation, high production, ease of set-up and precision work quality are features of 6-in. and 10-in. plain hydraulic cylindrical grinders described in 16-page illustrated catalog B-51. Semiautomatic in operation, machines can be equipped with wide range of accessories and optional equipment.

80. Single Groove V-Belts

Raybestos-Manhattan, Inc., Manhattan Rubber Div.—You will find descriptions and illustrations of improved Manhattan single groove V-belts in 8-page bulletin 6830 B. They are made with straight sidwalls for more grip. Folder has standardized belt numbers and list of standard sizes.

81. Sheet Grinding & Polishing

American Nickeloid Co.—Facilities for custom grinding and polishing stainless steel and other sheet metals up to 60 x 144 in. are detailed in illustrated folder. Surfaces with any degree of roughness or polish can be produced.

82. Wire Rope-Ology

Macwhyte Co.—"Wire Rope—So What?" is title of 4-page article appearing in publication Rope-Ology. It relates how neglect of this important accessory is costing users thousands of dollars. But it goes on to say that sensible care and attention will pay off well.

83. Conveyor Belt Data

New York Belting & Packing Co.—You'll find all the necessary data to lay out a drive or specify a belt in recently published catalog on conveyor and elevator belting. Carrying capacities, horsepower factors, pulley diameters, maximum and minimum plies for troughing are among info tabulated.

84. Coated Work Gloves

Mine Safety Appliances Co.—"They wear like leather." That's what bulletin No. CF-30 says about M.S.A. All-Purpose work gloves. Data sheet describes fully these vinyl-plastic coated fabric gloves that always remain flexible, do not become tacky and resist all kinds of acids, caustics and strong solutions.

85. Flexible Shafting

F. W. Stewart Mfg. Corp.—Advantages of flexible shafting and methods of application can be found in this 64-page illustrated book. It also shows many types of end fittings, casings, adapters and shaft combinations that apply to variety of standard sizes and types. There are over 400 illustrations to help you visualize your needs.

86. Mechanical Finishing

Mecha-Finish Corp.—Low cost deburring and finishing with abrasive Mecha-Finish chips is subject covered in 4-page illustrated brochure. Photographs of equipment and salient facts about process are included. Advantages include uniformity of product, savings in manhours, fewer rejects and increased output.

EDITORIAL REPRINTS:

87. Who's Who In Defense

If you find it necessary to contact key government defense personnel on matters pertinent to your segment of metalworking, you'll find this directory entitled "Who's Who in the Defense Organization" very helpful. Names were obtained from Office of Defense Mobilization and compiled by STEEL according to the various agencies.

88. Metal Working Data

Now available to STEEL readers in reprint form is the 48-page fourth edition of "Metalworking Facts & Figures" which tabulates latest statistics. Contents trace raw materials all the way through to end products of metal consuming industries. Related subjects such as labor, prices, and earnings are covered as well.

89. High Strength Bolts

Here's a reprint of an article entitled "High Strength Bolts" which appeared in STEEL's December 24th issue. It points out advantages and long range economy of using bolts in structural work. Classes of structures considered are those subjected to fluctuating dynamic loading, such as bridges and certain industrial equipment, and those subjected to static loading.

90. Future for Metalworking

Reprint entitled "Metalworking's Destiny" forcefully points to the gradual loss of industry's most valuable asset—the incentive to produce. Editorial, however, optimistically sets forth broad, far-reaching steps nation must take to restore this incentive and to realize its industrial destiny.

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items such as sand, stone or cement before application. For resurfacing, it is applied ⅜-inch thick.

Four-Way Valve Pilot

USE REPLY CARD—CIRCLE No. 20

Model MV-4-375, an air control valve announced by Airmatic Valve Inc., Cleveland, O., may be used with pilot valves to provide automatic and semiautomatic operation, sequence of operations and remote control paneling. Designed for use with air, oil or water at pressures up to 0-150 pounds, it is available for standard pipe sizes of ¼, ⅜, ½ and ¾-inch.

Controls Aluminum Etching

USE REPLY CARD—CIRCLE No. 21

A compound for the controlled etching of aluminum and its alloys is announced by Silver Star Chemical Corp., New York, N. Y. It eliminates problems of foaming, sludging, and hard scale formation. Production of a uniform controlled etch is possible by dipping or mechanical spraying.

Multiple Tube Purge Meter

USE REPLY CARD—CIRCLE No. 22

Multiple tube purge meter in a single integral unit, developed by Brooks Rotameter Co., Lansdale, Pa., is available in two, four or six tube units. All metering tubes and piping connections are precision-bored in a block of acrylic plastic.

Fast Drying Black Primer

USE REPLY CARD—CIRCLE No. 23

United Lacquer Mfg. Corp., Linden, N. J., has developed a fast drying black universal primer that clings to polished chrome, stainless steel, zinc or glass and establishes a base that anchors a protective coating. Known as VB 282, the vinyl plastic-base primer has flexibility that allows parts to be formed, extruded or blanked after they are finished.

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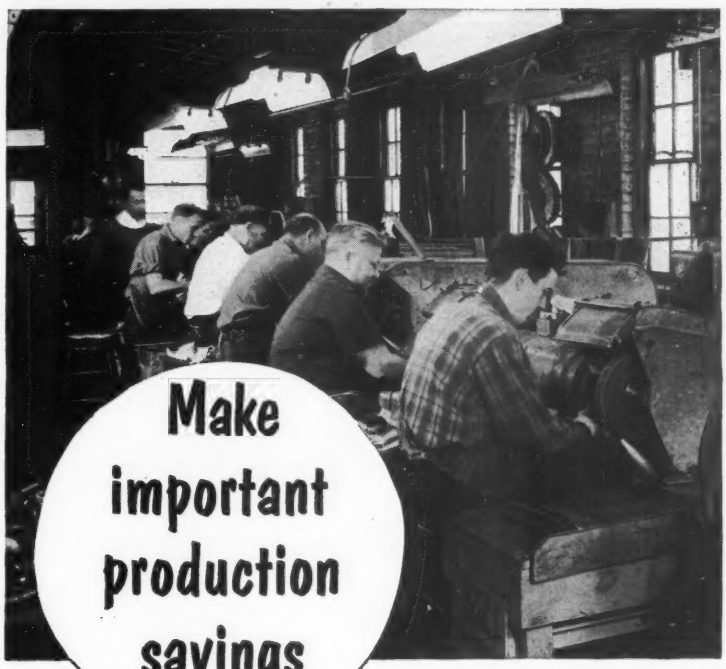


Make important production savings

***with* Jewel Brand Coated Abrasives!**

SAVINGS OF 30% and more on your abrasive costs are possible with longer-lasting, faster-cutting Jewel Brand Coated Abrasive Belts. Add to this the increased productivity and lower labor costs, and you can easily see why it's well worth your while to use Jewel Brand Coated Abrasives.

RESIN BONDED JEWEL BRAND BELTS eliminate cooling fluids and shedding. In addition, all Jewel Brand belts have an exclusive ***Velvet Joint*** that adds many hours of productivity, since poor joints can cut belt life up to 80%.

MAKE THE WASTE BARREL TEST! Send us a letter size sample (preferably including the joint) of a used belt taken from your waste barrel. In most cases, Jewel Brand Abrasive Engineers can recommend a Jewel Brand Belt that will do a better job, faster and for less money. No obligation of any kind. Simply fill in the coupon and send with used belt sample. →

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

Yes, I want to make the Waste Barrel Test! Enclosed is sample of used belt from our plant.

NAME_____

POSITION_____

COMPANY_____

TYPE OF PRODUCT_____ MATERIAL_____

WE USE APPROXIMATELY_____ BELTS PER MONTH

BELT LENGTH_____

for the purchase or sale of **scrap**

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

PLANTS
LEBANON, PENNA.
READING, PENNA.
DETROIT (ECORSE), MICHIGAN
MODENA, PENNA.
PITTSBURGH, PENNA.
ERIE, PENNA.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

OFFICES
BIRMINGHAM, ALA. Empire Building
BOSTON, MASS. Statler Building
BUFFALO, N. Y. Genesee Building
CHICAGO, ILLINOIS 100 W. Monroe St.
CLEVELAND, OHIO 1022 Midland Bldg.
DETROIT, MICH. 2011 Book Building
HOUSTON, TEXAS 1111 Texas Ave. Bldg.
LEBANON, PENNA. Lurya Building
LOS ANGELES, CAL. 3440 Wilshire Blvd.
NEW YORK, N. Y. 100 Park Avenue
PITTSBURGH, PA. Oliver Building
PUEBLO, COLORADO 111 Colorado Bldg.
READING, PENNA. Lurya Building
ST. LOUIS, MO. Boatmen's Exch. Bldg.
SAN FRANCISCO, CAL. 300 Montgomery St.
SEATTLE, WASH. Smith Tower

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

PARTIAL decontrol of steel distribution is urged for the near future. With certain tonnage products in better supply, and continuance of this trend indicated, threat of surpluses is becoming increasingly serious. Government control authorities appear cognizant of the situation, and the National Production Authorty is setting up a task force to look into the matter. NPA already has decontrolled chrome-stainless steels. Industry representatives now urge decontrol of secondary tin mill products, cold-rolled sheets and strip, merchant pipe (small diameter), and merchant wire products (fencing, barbed wire, etc.). All these items are in adequate supply, and, it is claimed, should not be continued under the Controlled Materials Plan. But whether the government will accede to the industry's request presents a big "IF" even though assurances have been gven that controls would be lifted as quickly as supply conditions permitted.

SUPPLY— Evidence accumulates of rising stocks although over-all supply-demand balance still appears months distant. Many consumers are carrying in excess of 45 days' inventory permitted under government regulations. Others are still pinched for tonnage. Generally, few are carrying anything like their normal inventory which averages 60 days and better. In some instances, inventories in excess of government limitations are attributable to distortions in supply arising from awkward distribution under CMP. Large tonnages also are being immobilized through stockpiling for defense production.

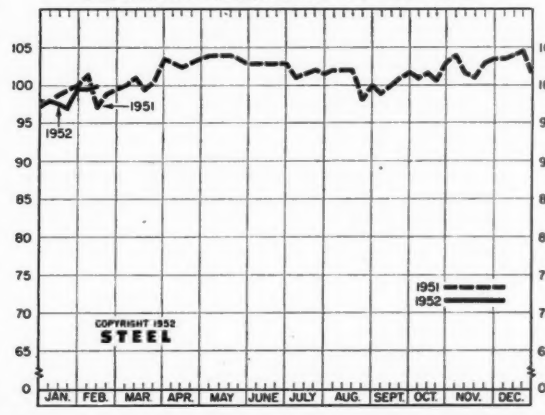
DEFENSE NEEDS—There is always the question of how much steel is going into direct defense. Figures are hard to pin down. But from the scanty evidence available the tonnage in relation to total production is relatively small. One prominent steelmaker's shipments on defense department and atomic energy account in December showed bars and semi-finished, 14.7 per cent; plates, 6.5; shapes, 3.2; hot-rolled sheet and strip, 16; cold-rolled sheet and strip, 5; total all products, 6.5. Whether these figures are typical is debatable. It is clear, however, defense demand, while rising month by month, still is relatively small. Some manufacturers think it will be well into 1953 before peak defense steel needs will be encountered.

PRODUCTS—Currently, steel products in most evident over-supply are secondary tin mill items, merchant pipe in small sizes, merchant wire trade products, and cold-rolled sheets and strip. Demand for industrial fasteners is reported off noticeably. Bolts and nuts are said to be available for delivery in 8 to 12 weeks now as against 16 to 20 weeks heretofore. Strip mill plates are more plentiful, and in some quarters are backing up. Move is under way to divert more demand for plates to the continuous mills, thus concentrating requirements for the heavy gages, in most acute supply, on the conventional mills. Bars appear in most stringent supply at the moment with military and related needs mounting. Structural shapes also are tight, but, increasingly, it looks like conditions will be much improved after midyear.

PRODUCTION—With steel mill operations in the Ohio Valley recovered from effects of the flood, labor trouble in a mill in the Cincinnati district last week prevented the industry from attaining scheduled production. The estimated national ingot rate, however, advanced ½ point to 100 per cent of capacity. Indicative of the pressure on the mills, January ingot output is estimated at 9,200,000 net tons, a surprising total in view of the scrap shortage.

PRICES—Market interest centers on possible early developments pricewise on steel and related products. Pending completion of industry meetings with OPS there is no telling which way the wind is blowing. Last week, reports were current in the trade of easiness in screw and other fastener prices as result of slackened demand and increasing foreign competition. Meanwhile, STEEL's weighted Index on finished steel holds unchanged at 171.92 as does the arithmetical price composite at $106.32.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 9	Change	Same Week 1951	Same Week 1950
Pittsburgh	101	+ 2*	96	95
Chicago	102	— 0.5*	94.5	100.5
Mid-Atlantic	99	0	98.5	76
Youngstown	106	0	106	92
Wheeling	100	+20	97	101
Cleveland	98	— 1.5*	25	96.5
Buffalo	104	0	104	101.5
Birmingham	104	0	100	100
New England	90	+ 3	85	80
Cincinnati	77	—26	106	101
St. Louis	85	— 1.5	88.5	84.5
Detroit	106	+ 1*	104.5	104
Western	100	+ 4.5	103	88.5
Estimated national rate	100	+ 0.5	97	91.5

Based on weekly steelmaking capacity of 2,082,617 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 45 Production-Engineering News—p. 81

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Feb. 7 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.36
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	52.54	30.17
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	29.56
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	30.79
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	32.08

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Feb. 7 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.18	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia	3.918	3.918	3.918	3.90	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ⅞-⅝", Pitts.	4.10-30	4.10-30	4.10-30	4.10-30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$31.00
Basic Valley	52.00	52.00	52.00	52.00	30.00
Basic, del. Phila.	56.61	56.61	56.61	56.39	32.01
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry, Del. Phila.	57.11	57.11	57.11	56.89	32.51
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	26.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.58	31.75
Malleable Valley	52.50	52.50	52.50	52.50	30.50
Malleable, Chicago	52.50	52.50	52.50	52.50	30.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	37.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.00*

* F.o.b., Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$44.00	$45.00	$32.50
No. 1 Heavy Melt. E. Pa.	42.50	42.50	42.50	43.50	33.75
No. 1 Heavy Melt. Chicago	42.50	42.50	42.50	43.50	30.00
No. 1 Heavy Melt. Valley	44.00	44.00	44.00	45.00	33.25
No. 1 Heavy Melt. Cleve.	43.00	43.00	43.00	44.00	32.50
No. 1 Heavy Melt. Buffalo	43.00	43.00	43.00	44.00	33.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	38.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.75	$8.75-$9
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	17.50	9.75-10.00
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	19.50-20.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	12.80-85
Tin, New York	121.50	121.50	103.00	182.50	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	50.00	42.00	28.25
Nickel, refinery, duty paid	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.50	58.00	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del.	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah, C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Feb. 7, 1952; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ...75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y., B2.56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ...85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 ....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3..77.00
Detroit R7 .....73.00
Gary,Ind. U5 .....89.00
Houston,Tex. S5 .....70.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ..$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
Los Angeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ..4.75
Portsmouth,O. P12 ....4.30
Reebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ...4.90
Worcester,Mass. A7 ...4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Stel Stand., Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 ....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ...3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ...5.50
Ind.Harbor,Ind. Y-1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
SoSanFrancisco B3 .....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 ....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ...4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 ....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ..3.95
Ashland,lcl(15) A10 ...4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif. (30) K1.4.30
Gary,Ind. U5 .....3.70
Granite City,Ill. G4 ....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1 3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ...3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5. Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 .3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2,Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ..4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 ....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 ....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Cantcn,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit, R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ...6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12,R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 ....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3..5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ...4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....(.....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ....4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ...5.00
Williamsport(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover,(Wrgh.Iron) U1 .12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt)L5 14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Monessen,Pa. P7 .....4.30
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 ....4.65
Seattle B3 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFrancisco S7 ....4.85
Torrance,Calif. C11 ....4.40
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ..4.75
Williamsport,Pa. S19 ..5.10

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah C11 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ..3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ...4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ...3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R., (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.69	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt, B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	3.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base.	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Midland,Pa. C18 ..... 5.85
NewBritn,Conn.(10) S15 5.45
Sharon,Pa. S3 ..... 5.85
Youngstown U5 ..... 5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewkBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
SharonPa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O. (40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Frtez-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	S15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland	A7 ....10.00
Dover,O.	G6 ....10.50
Fontana,Calif.	K1 ....11.65
Harrison,N.J.	C18 ....10.60
Midland,Pa.	C18 ....10.60
NewBritn,Conn.(10)	S15 10.75
Pawtucket,R.I.(11)	N8..10.75
Pawtucket,R.I.(12)	N8..11.05
Sharon,Pa.	S3 ....10.60
Worcester,Mass.	A7 ....10.30
Youngstown	C8 ....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8)	A10 ....3.75
Warren,O.	R2 ....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 ....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 ....4.05
Riverdale,Ill.	A1 ....3.90
Sharon,Pa.	S3 ....4.15
Youngstown	U5 ....3.75

WIRE, Tire Bead

Bartonville,Ill.(1)	K4 ..10.90
Monessen,Pa.	P16 ....11.40
Roebling,N.J.	R5 ....11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity	R2.. 5.70	5.95
Aliquippa	J5 .... 5.70	6.15
Atlanta	A11 .... 5.95	6.40
Bartonville(19)	K4 5.70	6.15
Buffalo	W12 .... 4.85	...
Cleveland	A7 .... 5.70	6.15
Crawfordsville	M8 5.95	6.40
Donora,Pa.	A7 .. 5.70	6.15
Duluth,Minn.	A7.. 5.70	6.15
Fairfield	T2 .... 5.70	6.15
Houston,Tex.	S5 .. 6.10	6.55
Johnstown	B2 ... 5.70	6.15
Joliet,Ill.	A7 .... 5.70	6.15
KansasCy,Mo.	S5. 6.30	6.75
Kokomo	C16 .... 5.80	6.05
LosAngeles	B3 .. 6.65	...
Minnequa	C10 ... 5.95	4.45
Monessen	P7 .... 5.95	6.40
Palmer	W12 .... 5.15	...
Pitts.,Calif.	C11.. 6.65	6.80
Prtsmth.(18)	P12 .. 6.10	6.60
Rankin	A7 ..... 5.70	6.15
So.Chicago	R2 .. 5.70	5.95
So.S.Fran.	C10 .. 6.65	7.10
SparrowsPt.	B2 .. 5.80	6.25
Sterling,Ill.(1)	N15 5.70	6.15
Struthers,O.	Y1 .. 5.70	6.15
Torrance,Cal.	C11 6.65	...
Worcester	A7 .... 6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill.	L1 .... 8.65	8.90
Bartonville,Ill.	K4 8.55	8.80
Buffalo	W12 .... 8.55	8.80
Fostoria,O.	S1 .. 8.85	9.10
Johnstown,Pa.	B2 8.55	8.80
Monessen,Pa.	P16 8.55	8.80
Monessen,Pa.	P7. 8.80	9.05
Palmer,Mass.	W12. 8.85	9.10
Portsmouth,O.	P12 8.55	8.80
Roebling,N.J.	R5. 8.85	9.10
SparrowsPt.	B2.. 8.65	8.90
Struthers,O.	Y1.. 8.55	8.80
Worcester	J4, T6. 8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2 ...4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill.(1)	K4 ...4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	M8 .5.10
Donora,Pa.	A7 .....4.85
Duluth,Minn.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O.(24)	S1 .....5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 ....5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ....5.10
Monessen,Pa.	P7 .....5.10
Newark, 6-8 ga.	I-1 ...5.50
No.Tonawanda	B11 ....4.85
Palmer,Mass.	W12 ....5.15
Pittsburg,Calif.	C11 ....5.80
Portsmouth,O.	P12 ....5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10 ...5.80
SparrowsPoint,Md.	B2 ..4.95
Sterling,Ill.(1)	N15 ....4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ....5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 .....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	M8..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ...6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 .....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ...6.50
Pawtucket,R.I.(12)	N8..6.85
Trenton,N.J.	R5 .....6.15
Worcester,Mass.	A7 ....6.15
Worcester,Mass.	T6 ....6.50
Worcester,Mass.	W12 ...6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 .....8.50
Monessen,Pa.	P16 .....8.50
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 ..8.60
Johnstown,Pa.	B2 .....8.50

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 10.25	11.95
Cleveland	A7 ....10.25	12.15
Crawfrdsville	M8.10.30	12.00
Fostoria,O.	S1 ...10.40	13.00
Johnstown	B2 ...10.25	12.15
Kokomo	C16 ....10.25	11.95
Minnequa	C10 ...10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ...10.60	12.50
Prtsmth.(18)	P12.10.55	12.30
SparrowsPt.	B2 ..10.35	12.25
Waukegan	A7 ...10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa.	J5 .....6.25
Alton,Ill.	L1 .....6.45
Bartonville,Ill.(1)	K4 ..6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth,Minn.	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass.	(12), N6 ..8.05
Monessen,Pa.	P7, P16..6.25
Palmer,Mass.	W12 .....6.55
Pittsburg,Calif.	C11 ....7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 .....6.25
So.Chicago,Ill.	R2 .....6.25
So.SanFrancisco	C10 ...7.20
SparrowsPoint,Md.	B2 ..6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 .....6.25
Worcester	A7, T6, W12.6.55
Worcester,Mass.	J4 ....6.75

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1)	K4 ...8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	M8..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Palmer,Mass.	W12 .....9.20
Portsmouth,O.	P12 ....8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 .....8.90
Worcester,Mass.	A7, T6.9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala.	R2 ...137
Aliquippa,Pa.	J5 141
Atlanta	A11 144
Bartonville,Ill.(19)	K4 ..144
Crawfordsville,Ind.	M8 ..146
Donora,Pa.	A7 141
Duluth,Minn.	A7 141
Fairfield,Ala.	T2 141
Houston,Tex.	S5 149
Johnstown,Pa.	B2 141
Joliet,Ill.	A7 141
KansasCity,Mo.	S5 153
Kokomo,Ind.	C16 143
Minnequa,Colo.	C10 147
Monessen,Pa.	P7 146
Pittsburg,Calif.	C11 161
Portsmouth,O.(18)	P12 ..148
Rankin,Pa.	A7 141
So.Chicago,Ill.	R2 137
So.SanFran.,Calif.	C10 ..161
SparrowsPoint,Md.	B2 ..143
Sterling,Ill.(1)	N15 141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala.	R2 ...123
Atlanta	A11 126
Bartonville,Ill.(19)	K4 ..123
Crawfordsville,Ind.	M8 ..132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind.	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So.Chicago,Ill.	R2 123
So.SanFran.,Calif.	C10 ..147
SparrowsPoint,Md.	B2 ..125
Sterling,Ill.(1)	N15 123

WIRE,Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16..5.90
New Haven,Conn.	A7 ...6.20
Palmer,Mass.	W12 .....6.20
Pittsburg,Calif.	C11 ....6.85
Portsmouth,O.	P12 .....5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10....6.85
SparrowsPoint,Md.	B2..6.00
Torrance,Calif.	C11 ....6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 .....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala.	R2 ...127
Ala.City,Ala.,17-18ga.	R2 214
Aliquippa,Pa.	9-14½ga.J5 131
Atlanta	A11 134
Bartonville,Ill.(19)	K4 ..131
Crawfordsville,Ind	M8 ..133
Donora,Pa.	A7 131
Duluth,Minn.	A7 131
Fairfield,Ala.	T2 131
Houston,Tex.	S5 139
Johnstown,Pa.	B2 131
Johnstown,17ga.,6"	B2...205
Johnstown,17ga.4"	B2...208
Joliet,Ill.	A7 131
KansasCity,Mo.	S5 143
Kokomo,Ind.	C16 133
Minnequa,Colo.	C10 139
Monessen,Pa.	P7 136
Pittsburg,Calif.	C11 154
Portsmouth,O.(18)	P12 ..138
Rankin,Pa.	A7 131
So.Chicago,Ill.	R2 127
Sterling,Ill. (1)	N15 131

FENCE POSTS

ChicagoHts.,	Ill. C2 140
Duluth,Minn.	A7 125
Franklin,Pa.	F5 140
Huntington,W.Va.	W7 140
Jonhstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago,Ill.	R2 140
Tonawanda,N.Y.	B12 140
Williamsport,Pa.	S19 150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 ....9.85
Lebanon, Pa.(31)	B2 ....9.85
Minnequa,Colo.	C10 ....9.85
Pittsburgh	O3, P14 ....9.85
Seattle	B3 .....10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala.	R2 118
Aliquippa,Pa.(13)	J5 118
Atlanta	A11 121
Bartonville,Ill.(19)	K4 ..118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	M8 ..122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 126
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 120
Minnequa,Colo.	C10 123
Monessen,Pa.	P7 124
Pittsbug,Calif.	C11 137
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2....120
Sterling,Ill.(1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3 ..$7.35
Wheeling,W.Va.	10 ....7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ....4.50
Lackawanna,N.Y.	B2 ..4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ....4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bassemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	U5 .....4.70
Lackawanna,N.Y.	B2 ...4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1.6.15
KansasCity,Mo.	S5 ....6.40
Lebanon,Pa.	B2 .....6.15
Minnequa,Colo.	C10 ....6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 .....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S13 ....5.60
Johnstown,Pa.	B2 .....5.60

RAILS

	Std. No. 1	Std. No. 2	All No. 2	60 lb Under
Bessemer,Pa.	U5	3.60	3.50	3.55	4.00
Ensley,Ala.	T2	3.60	3.50	...	4.00
Fairfield,Ala.	T2	...	...	...	4.00
Gary,Ind.	U5	3.60	3.50	3.55	...
Huntington,W.Va.	W7	...	...	...	5.00
Ind.Harbor,Ind.	I-2	3.60	3.50	3.55	...
Johnstown,Pa.	B2	...	...	...(16)	4.00
Lackawanna,N.Y.	B2	3.60	3.50	...	4.00
Minnequa,Colo.	C10	3.60	3.50	...	4.50
Steelton,Pa.	B2	3.60	3.50	...	...
Williamsport,Pa.	S19	...	...	...	4.75

Std. Tee Rails

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.505
18	4	2	....		1.650
20.25	4.25	1.6	12.25	3.535	3.675
19	4	2	7		2.460
18.25	4.25	1	4.75		2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.985
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 2 cols. lower.
(8) 16 gage and heavier
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) 1/16" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 28" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. & square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.033"; 0.033" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

the magnet that answers THE NEED

Dings New Improved Lifting Magnet . . . Weighs Less, Lifts More, and Lasts Longer

THIS latest Dings magnet has *all* the features necessary for maximum scrap yard performance. A few examples . . .

WELDED STEEL CONSTRUCTION—eliminates the moisture danger, makes a strong rigid magnet that can take the hard blows.

LIGHTER WEIGHT—*More* of the weight your crane is carrying will be payload. A balanced magnetic circuit of advanced design makes this difference.

MAXIMUM POWER, LONGER—No. 1 reason for this is less heat rise due to the improved magnetic circuit. In addition, a new, finer insulating compound dissipates strength-sapping heat, prevents electrical leakage between coil wires.

Those are the *big* new features. There are a dozen other important ones you'll be interested in.

FOR FULL DETAILS, WRITE for the LIFTING MAGNET CATALOG.

DINGS MAGNETIC SEPARATOR CO.

4710 W. Electric Ave., Milwaukee 46, Wis.

Dings *Certified* **MAGNETIC STRENGTH**

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½ % on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜"; Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ¼" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....	....
Inconel.	41.23	54.18	....	....	....	....	165.00
Monel .	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled, ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless paltes, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅞-in	18.5
1-in. and larger ..	17.5

Longer than 6 in.:

All diams.	14
Lag bolts, all diams.:	
6 in. and shorter ...	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅞-in..	12	6.5
1-in.-1½-in. ..	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	16.5	6.5
1-in.-1½-in. ..	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	23	17.5
1-in. & 1⅛-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
⅝-in. & ⅞-in. ..	29.5	22
1-in.-1½in.	24	15
1⅛-in. & larger .	13	8.5
	Light	
⅛-in. & smaller	35	
¼-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10

Plated finishes .... 31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in. .	34

Longer than 6 in.:

⅝-in. & smaller ...	26
¾-in. through 1 in. .	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged: per cent off list)

No. 10 and smaller.... 35

¼-in. diam. & larger.. 16

N.F. thread, all diams. 10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers...List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg..26.00-33.00

Industrial xylol..25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia..$32-$45

Cents per pound, ovens

Phenol. 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron 98+% Fe, carlots..	17.00
Swedish, c.i.f. New York, in bags..	8.85-9.95
Electrolytic Iron:	
Annealed, 99.5% Fe.	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns .	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Antimony	75.85
Brass, 10-ton lots.	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 ton lots	50.00
Copper:	
Electrolytic ...	37.25-46.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh ..	57.00
Minus 35 mesh	52.00
Minus 200 mesh ...	62.00
Nickel unannealed ..	86.00
Nickel-Silver 10-ton lots	45.00
Silicon	38.50
Solder (plus cost of.. metal)	8.50
Stainless Steel, 302 ..	83.00
Zinc, 10-ton lots.	23.00-30.50

Tungsten	Dollars
Melting grade, 99%, 60 to 200 mesh, freight allowed:	
1000 lb and over ..	6.00
Less than 1000 lb..	6.15
98.8% minus 65 mesh, freight allowed:	
1000 lb and over ..	4.15
Less than 1000 lb..	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil.fur. .$14.50-15.00

Connelsvil,fdy. ..17.00-18.00

New River foundry ..21.30

Wise county, foundry..15.95

Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearny, N. J. ovens..$22.75

Everett, Mass., Ovens New England, del..*24.80

Chicago ovens 23.00

Chicago, del. 24.50

Terre Haute, ovens ..22.50

Milwaukee, ovens ...23.75

Indianapolis, ovens ...22.75

Chicago, del. 26.42

Cincinnati, del. 25.85

Detroit, del. 26.85

Ironton, O., ovens ...22.50

Cincinnati, del 25.12

Painesville, O., ovens.24.00

Cleveland, del 25.82

Erie, Pa., ovens 23.50

Birmingham, ovens ..20.30

Birmingham, del. ...21.60

Philadelphia, ovens ...22.70

NevilleIsland,Pa.,ovens 23.00

Swedeland, Pa., ovens 22.60

St. Louis, ovens St. Louis, del. 25.40

Portsmouth, O., ovens.22.50

Cincinnati, del. 25.12

Detroit, ovens 24.00

Detroit, del. 25.00

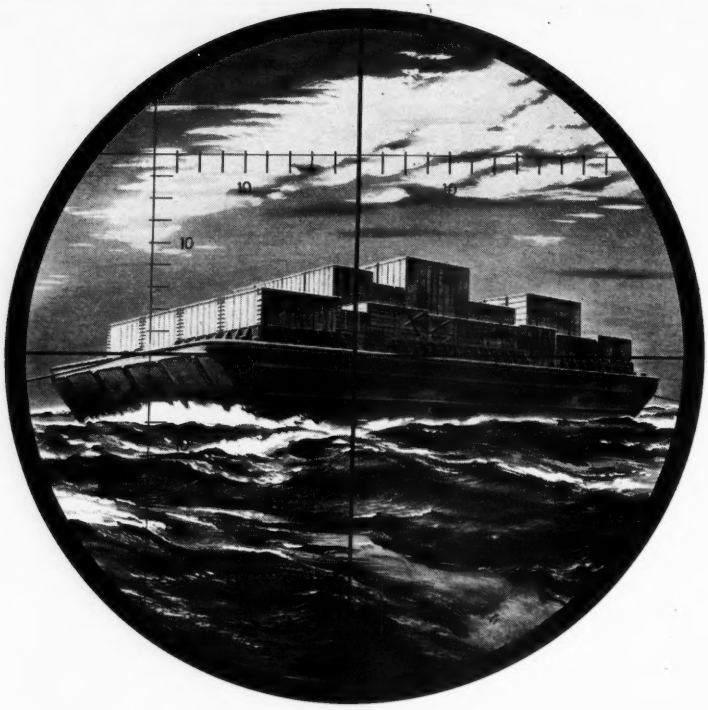
Buffalo, del. 26.89

Flint, del. 26.59

Pontiac, del. 25.47

Saginaw, del. 26.92

* Or within $4.15 freight zone from works.



Target for steel

More steel barges to transport military goods are an urgent necessity in our national security program.

With sights on this target—as well as scores of others vital to preparedness—Kaiser Steel is on a round-the-clock schedule to produce steel plate and other critically needed products.

While helping to meet such government priorities, Kaiser Steel is still able to supply a considerable quantity of steel to western manufacturers of important civilian products.

The reason: Kaiser Steel's rated capacity has increased to 1,380,000 ingot tons annually. Nearly 2½ times the amount produced in 1944—the peak war year!

More evidence that the West Coast's only integrated, *independent* steel plant is helping to build a stronger West . . . and a stronger nation!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.37	7.21	8.55	7.05	...	6.59	7.53	9.28	6.34	6.71	7.98
JerseyCty(c'try)	6.07	6.91	8.25	6.75	...	6.29	7.23	8.98	6.04	6.41	7.68
Boston (city) ..	6.40	7.18	8.55	6.35	...	6.25	7.04	9.00	6.40	6.55	7.84
Boston (c'try)..	6.20	6.98	8.35	6.15	...	6.05	6.84	9.20	6.20	6.35	7.64
Phila. (city) ..	6.04	6.97	8.35	6.33	7.11	6.29	7.16	8.92	6.10	6.34	7.39
Phila. (c'try) ..	5.79	6.72	8.10	6.08	6.86	6.04	6.91	8.67	5.85	6.09	7.14
Balt. (city) ...	6.22	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	6.02	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.00	7.20	...	6.30	6.30	7.15
Richmond, Va..	5.95	6.57	8.10	6.14	...	5.91	6.59	...	6.22	6.86	7.47
Wash. (w'hse) .	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)..	5.74	6.52	8.29	6.06	...	5.80	6.65	10.65††	6.00	6.23	7.55
Buffalo (w'hse).	5.54	6.32	8.09	5.86	...	5.60	6.45	10.45††	5.80	6.03	7.35
Pitts. (w'hse)..	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse).	5.75	6.47	8.12	5.76	7.15	5.76	6.64	9.13	6.09	5.88	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.18	5.82	6.60	8.91	6.15	6.02	7.39
Cleve. (w'hse) .	5.54	6.32	7.96	5.65	6.98	5.62	6.40	8.71	5.95	5.82	7.19
Cincin. (city ..	5.99	6.53	8.44	5.92	...	5.90	6.79	...	6.21	6.29	7.43
Chicago (city).	5.77	6.54	8.08	5.70	...	5.67	6.50	10.47††	5.85	5.92	7.09
Chicago (w'hse)	5.57	6.34	7.88	5.50	...	5.47	6.30	10.27††	5.65	5.72	6.89
Milwau. (city).	5.90	...	8.21	5.85	...	5.83	6.81	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.61	10.26††	5.81	5.86	7.05
St. Louis (del.)	6.02	6.85	8.20	6.00	...	5.95	6.85	10.55	6.22	6.27	7.46
St. L. (w'hse).	5.82	6.65	8.00	5.80	...	5.75	6.65	10.35	6.02	6.07	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.Cty(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30[3]	9.55	6.60	10.65	6.45	8.35	...	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.35	6.40	10.45	6.25	8.15	...	6.30	6.30	8.55
Seattle-Tacoma.	7.04	8.64	9.25	7.04	...	6.70	8.80	10.35	6.54	6.78	8.73
San Francisco..	6.62	7.88[3]	9.10[3]	6.58	...	6.45	8.20	11.15	6.45	6.37	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gage; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.6c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa., $99.60, Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

Ladle Brick

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

Malleable Bung Brick

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

Basic Brick

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

Magnesite

Per net ton. Chewelah, Wash., Luning, Nev. Domestic dead-burned, ¾" grains; bulk, $36.30; single paper bags, $41.80.

Dolomite

Per net ton. Domestic burned bulk; Bonne Terre, Mo., $13.00; Martin, Millersville, Nario, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.75.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c, Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: For current quotations on manganese, titanium and "other" ferroalloys, see page 103, Jan. 28 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 189, Feb. 4 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Feb. 7	$43.00
Jan. 31	43.00
Jan. 1952	43.00
Feb. 1951	44.00
Feb. 1947	33.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala..	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa...	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively. (2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10. (3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses, otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O. 51c.
Warren, Pa., 75c; Weirton, 70c.
Youngstown, 75c.

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd.	33.00
Unprep'd.	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point.

For High Density Bales... Use Self-Contained

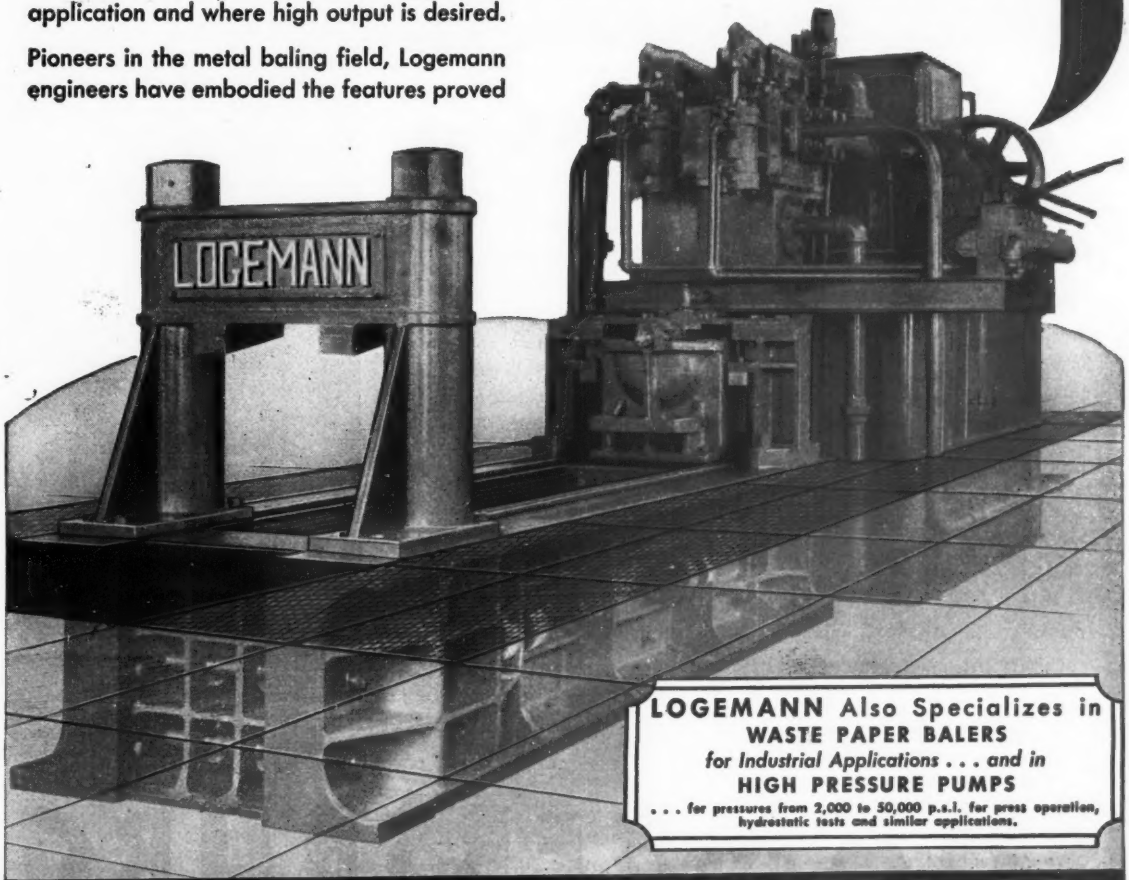
LOGEMANN Scrap Presses

Press, Pump, Tank... All in One Compact Assembly

Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

Pioneers in the metal baling field, Logemann engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. Logemann engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.



LOGEMANN Also Specializes in
WASTE PAPER BALERS
for Industrial Applications . . . and in
HIGH PRESSURE PUMPS
. . . for pressures from 2,000 to 50,000 p.s.i. for press operation, hydrostatic tests and similar applications.

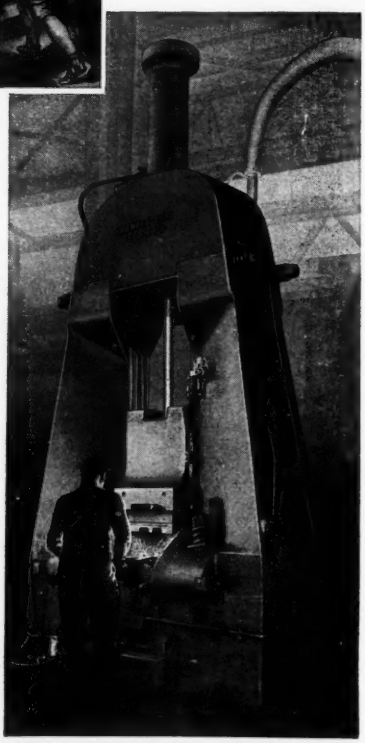
LOGEMANN BROTHERS CO.

3164 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Painted by C. Schussele, 1864 for Jos. Harrison, Jr. *Courtesy Cochrane Corp., Phila., Pa.*

THE BLACKSMITH AND KING SOLOMON

When the temple at Jerusalem was completed, King Solomon gave a feast to all employed in its construction. At the banquet, upon unveiling the throne, a blacksmith was found on the seat of honor, next to that of the King. When the crowd would have killed him for his impudence, Solomon stopped them saying, "Let him speak." Said the smith, "Thou had, O King, invited all craftsmen but me. Yet how could these builders have raised this temple without the tools I have fashioned?" "True," decreed Solomon, "the seat is his of right. All honor to the blacksmith!"



THE IMPORTANCE OF FORGING:

Through the ages, whenever metal parts had to stand up under greater-than-ordinary punishment, the metal was heated in a furnace and hammered into shape.

Hammering the hot metal did several things that no other form of manufacture did. It made it stronger and it made it tougher. The ancient smith had no microscope to tell him that the metal he was forming was crystalline in structure, and that the hammering broke the larger crystals into smaller ones with greater adhesion to each other, and that the hammering also compressed the crystals, made them into long needle-like shapes, forming the "grain" that contributed to the metal parts' high tensile strength. The smith only knew that hammering made the metal tougher and stronger and that this toughness and strength came *only* from hammering.

Today, after centuries of metallurgy and metal working, hammering is still the only way to achieve maximum strength and toughness in metal.

Chambersburg, the hammer builders, have been engaged for over half a century in the design and manufacture of hammers to meet modern conditions—to make metal parts that are stronger and tougher than those made by any other process.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

The Metal Market

Order restricting use of copper and steel and prohibiting use of aluminum in construction of houses expected to be issued soon by National Production Authority

RESTRICTIONS on use of strategic metals in construction will be tightened. Several orders are being prepared by National Production Authority which will conserve supplies for defense and defense-supporting programs. In the case of aluminum, for instance, new production is coming in steadily, but there are many claimants for it. NPA officials believe some time will elapse before allotment of aluminum to civilian users can be increased substantially.

NPA allotted, starting Apr. 1, enough materials to allow the start of some 600,000 dwellings this year compared with 1 million in 1951. A proposed order would limit the amounts of steel and copper as follows on the basis of single-family units: For houses using steel plumbing systems, 1.4 lb of carbon steel for each square foot, but not exceeding 1700 lb; and 0.025 lb of copper for each square foot, but not exceeding 30 lb.

For houses using copper plumbing systems, 1.2 lb of steel per square foot, but not exceeding 1450 lb; and 1.25 lb of copper for each square foot, but not exceeding 130 lb.

For houses using sheet metal ducts for heating, an additional 0.3 lb of steel per square foot may be used, but not exceeding 350 lb.

For two-family, three-family, and four-family units, the foregoing amounts are multiplied by two, three and four, respectively.

Aluminum Stocks Drop—This order would ban entirely the use of aluminum in house construction, except by special authorization. Although production is gaining steadily and consumption in civilian goods is restricted, stocks of primary aluminum at refinery plants were at a three-year low at the end of November, amounting to only 9028 tons.

Allotments of aluminum to the roofing and siding industry for the second quarter will amount to about 9 million pounds.

Much Copper Remains "Hidden"

Skepticism is growing among consumers as to the necessity for the severity of the copper shortage. Many would like the government to be more frank about the size of its stockpile and be more lenient in releasing tonnages to alleviate the present emergency, one of the chief purposes for its establishment.

They also would like clarification of the foreign copper situation, both pricewise and as it relates to the International Materials Conference.

In regard to "hidden" stocks, there is increasing evidence substantial tonnages are being held for speculation and as protection, in some instances, by consumers who feel they may not be able to obtain necessary supplies for future operations.

Simon D. Strauss, vice president, American Smelting & Refining Co., New York, says: "Any consumer who is stampeded into planning a permanent switch from copper to some other material, inferior to copper for the specific use involved, will eventually regret his decision."

Lead and Zinc Supplies Rising

Lead and zinc should be decontrolled as to price; then the shortages will disappear. This is the opinion of Felix E. Wormser, vice president, St. Joseph Lead Co., New York. He points out that government price ceilings last year resulted in a severe slump in imports to only 275,000 tons, or half the record 550,000 tons imported in 1950. "In a free market," he says, "the price might have risen for a short time here until international supply and demand came in line and then would have declined."

Don't look for an abundance of lead in the next four years. Ralph S. Trigg, deputy director, DPA, reveals a tentative expansion goal to provide 940,000 net tons of lead from domestic mine production and imports in 1955. This provides for an increase in supply of 165,000 tons above the 1949 supply of about 775,000 tons from these sources.

Even with this authorized expansion, the supply of lead will not be sufficient to meet civilian and military demand in 1953, 1954 and 1955. The deficit in the latter year is forecast at 203,000 tons. DPA plans to review the program soon to determine the effect of foreign expansions as possible sources of additional ores or metals.

Federal assistance has been given for about 47,000 tons of additional production annually. St. Joseph Lead Co.'s new mine at Hayden Creek, Mo., is scheduled to get into production this year with 11,500 tons of lead annually; American Smelting & Refining Co.'s new mine at Wallace, Idaho, is expected to produce 9000 tons of lead a year beginning in 1953; St. Joseph Lead's new mine at Indian Creek, Mo., is expected to produce 17,500 tons of lead a year beginning in 1954.

In addition to this, an estimated 9000 tons of additional production of lead is expected to result from expanded zinc production, in which some lead ore is recovered.

A maximum of 29,000 tons of zinc will be made available for defense purposes through two transactions involving the national stockpile. A total of 14,000 tons of metal that was contracted for the stockpile for the first half of this year will be diverted into commercial channels. In addition, sufficient zinc ore will be withdrawn from the stockpile to provide up to 15,000 more tons of slab zinc for the first half of 1952.

The price of foreign zinc is now only about two cents above the domestic ceiling and a further decline is expected due to lack of buying interest abroad. Consumers will be able to tap this large source as soon as the import duty is suspended.

RESEARCHERS REWARDED: Because of their part in the development of a hard coating finish for aluminum alloys, metallurgical engineers Paul W. Boone and Charles F. Burrows receive congratulations and incentive awards from Herman Pusin, chief structural engineer of the Glenn L. Martin Co., Baltimore. Burrows and George Holback, laboratory chief, far right, hold aircraft parts coated by the new MHC (Martin Hard Coating) process. Aluminum Co. of America agreed to assist other manufacturers install MHC facilities

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $203-$207 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire, del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 200 lb cans only, less than 100 lb. to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.6c; 700 to 1900 lb. 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 1-7	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
Jan. 22-31	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. 2-21	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

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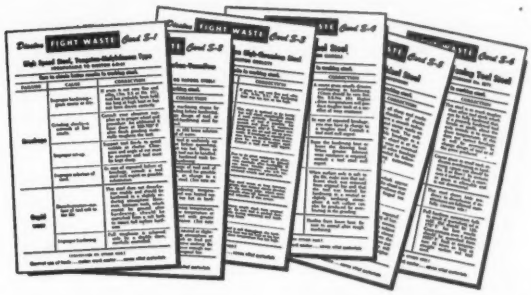

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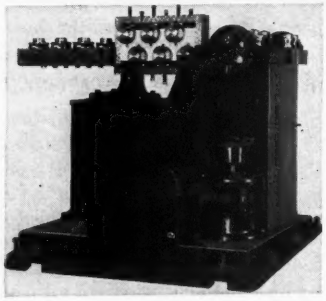

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Steel Bars . . .

Bar Prices, Page 151

Cleveland—Military and related requirements are expected to take an increasingly larger tonnage of bars as the weeks pass. Consequently, no substantial easing in supply conditions is expected in this product over coming months, especially as regards the larger sizes. Cutbacks in civilian goods requirements are permitting diversion of tonnage to defense account. Still, it is understood a substantial number of second quarter CMP tickets are unplaced with the mills booked virtually full for the period.

New York—Despite easing in certain products, notably cold-rolled sheets, strip and wire, carbon bars remain in tight supply. Particularly stringent are larger sizes, 3 in. and over, and some very small sizes. Consumers claim they have difficulty getting what they want not only from the mills but from warehouses as well. Warehouse stocks have improved only slightly.

Philadelphia—While large sizes are especially scarce, virtually all sizes of hot-rolled carbon bars are difficult to obtain. In contrast with some light flat products, supply of bars appears to be becoming tighter with demand expanding rapidly for shell components and other military needs. No letup is noted in alloy grades.

Pittsburgh — Cutbacks in civilian durable goods are only slightly reflected at district mills pressing to keep production at high levels. Defense requirements are rising recently and inquiries from the far west are making the rounds. Demand continues strong with forging, cold-finished and hot-top quality material hardest to obtain. Slight easing is noted in smaller sizes.

Chicago—Smaller sizes of carbon bars are somewhat more plentiful. Larger sizes, however, remain tight. This is true also of forging grades.

Sheets, Strip . . .

Sheet and Strip Prices, Page 151 & 152

Boston—Equipment builders for soft goods manufacture no longer are pressed by steel shortages. Considering the slump in several industries, shoes, textiles and packaging among others, current supply is adequate. Where copper and brass are needed for production of goods, these metals tend to regulate steel consumption. Practically all types of sheets are easier, hot-rolled and galvanized less than other grades.

Philadelphia—Backing up of cold sheet demand in the Detroit area and temporary easing in tin plate specifications are reflected in freer cold sheet and strip offerings in the local district. However, barring these items and some specialties, such as enameling stock and low silicon sheets, all other grades remain tight. Few cancellations are reported despite the lag in consumer durable lines.

Pittsburgh — District mills think another 4 to 6 weeks will definitely show which way the present easing in flat-rolled sheet and strip supply is going to end. Many say if the increasing supply continues government con-

trols should be removed. It will be the mills that are seeking CMP tickets and not consumers searching for homes for their unfilled orders. Cold-rolled material is fast approaching the equalization stage, hot-rolled has become slightly tighter and galvanized continues in tight supply.

Cleveland — While pressure for sheets and strip is definitely easier than some time back, the mills do not anticipate much improvement in supply conditions before last half of the year. Bookings for second quarter are heavy and there are few openings left in rolling schedules. In a number of instances sellers have order cancellations from civilian goods manufacturers but the tonnages involved are not large. Difficulty is being encountered in disposing of seconds and rejects. Some of this class of material is reported being returned to the furnaces as scrap.

Cincinnati — District sheet mills, filling schedules for second quarter, report less pressure for cold-rolled and some other grades. Tonnage for direct defense needs will be near that taken in first quarter, and this demand and bookings of hot-rolled and light plates for indirect military requirements mean tight supplies.

St. Louis—The cold-rolled sheet market is dull. Users are checking inventories and until that is completed there is no eagerness to place new orders. Cancellations, however, are relatively few. Second quarter schedules were sold out without trouble, but buyer's specifications are coming in slower than usual.

Birmingham—Demand for sheets continues strong in this territory. Slackening reported elsewhere is not evident here.

Los Angeles—Softening of requirements of some sheet and strip consumers, among them appliance manufacturers, is affecting overall demand. Hot-rolled sheets are available from premium price sources at 8.5 cents per pound.

Wire . . .

Wire Prices, Page 153

Boston—Slight upturn in requirements for high carbon wire specialties is apparent despite the fact buying is held down by inventory limitations. Overall slackening in demand has been halted temporarily with new inquiry well spread. Automotive releases are moderately improved, also precision spring requirements due to somewhat heavier defense needs. Earlier depletion of backlogs, with some deferments, has placed most producers in position to make better delivery for second quarter. Most consumers are specifying second quarter allotments of high carbon to the extent of tickets. Heading and free machining grades of finished wire and rods have not eased to the extent of most lower carbon grades. Most screw manufacturers are operating under the post-Korean peak, but they are ordering to the extent of CMP allotments.

Birmingham — Government restrictions have caused some easing in demand for certain wire products in some areas but steel men here point out that the South traditionally is the last to feel such a trend. As a result, demand for every specificati•n

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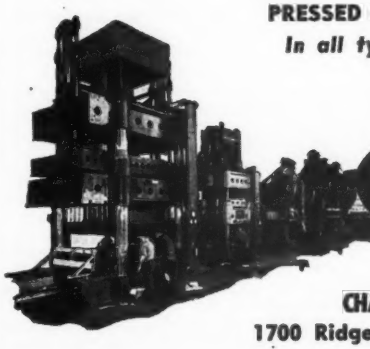

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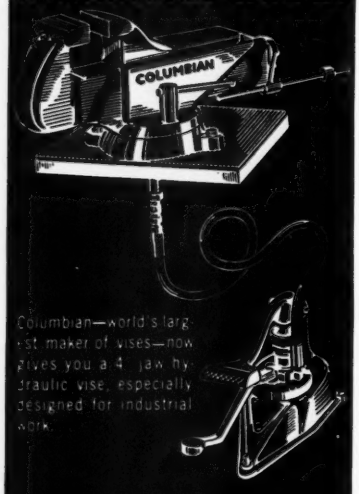

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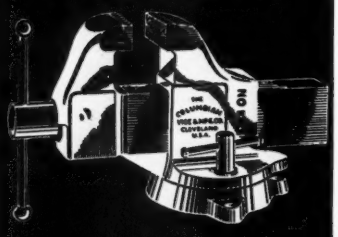

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 151

Chicago—Several Chicago construction projects stymied by lack of steel include the Congress St. expressway, a water filtration plant and sewer construction. Mayor Kennelly appealed to Washington for 20,000 tons of steel for the last three quarters of this year and was assured the most favorable action possible.

Los Angeles—Demand for reinforcing material is tending upward but fabricators have no trouble getting enough tonnage to meet priority requirements.

Seattle—No major reinforcing contracts have been taken by local mills the last month. Public works projects involve large tonnages and will be awarded soon. Mills are operating at capacity.

Plates . . .

Plate Prices, Page 151

Washington—Demand for wide and heavy steel plate is taxing mill capacity and will continue to do so through 1952.

That's what the National Production Authority was told at its latest meeting with the industry advisory committee. Production, increasing since late 1950, may reach a peak in second quarter almost doubling output of the base period, first eight months of 1950.

Direct defense and defense-supporting needs, however, are increasing and can be met only by maintaining production at highest possible level.

The committee suggested, that, if necessary, a limitation order establishing minimum gages to be rolled on certain sheared mills would conserve capacity and improve productivity for wide and heavy plate.

Philadelphia—Although light gage plate is less difficult to obtain than heavier gage material, for the reason more plate tonnage is coming from the strip mills, the over-all situation in plates is still tight. Few consumers are getting as much tonnage as they want. Meanwhile, producers are either sold out for the second quarter, or are reserving a certain tonnage for regular customers, pending final word as to what allocations are going to be. Actually, various buyers haven't yet been definitely informed as to what their full quotas are going to be and, consequently, because of government regulations, haven't been able to specify more than 60 per cent of their allotments for fourth quarter of last year.

Pittsburgh—District producers expect no easing in supply throughout remainder of 1952 although conditions here are not as bad as they were three or four months ago. Some relief is afforded by rolling light gage material on continuous hot-strip mills. Inquiries for filling CMP tickets are coming into this district from the West but there is no available rolling time open. Second quarter bookings are about completed with many CMP tickets yet to be placed.

Chicago—Plate supply appears less tight than at any time in recent months. This applies in particular to narrow and lighter types. Wide and heavy show little change.

Birmingham—Continued brisk activity in carbuilding is accounting for a considerable tonnage of plates. Tanks also are being produced in good volume and diversion of much tonnage to steel pipe remains a factor in the supply situation.

Seattle—Sizable plate tonnages are involved in two Washington - state power projects, bids to U. S. engineer next month. Bid invitations for bulk aircraft fuel tanks at McChord field, Washington, have been withdrawn and the project postponed. Small shops are struggling with plate shortages.

Tin Plate . . .

Tin Plate Prices, Page 152

Washington—With heavy stocks of secondary tin products backing up at mills and warehouses the Tin Plate Industry Advisory Committee to NPA is urging immediate discontinuance of controls over distribution of these products.

Recent survey indicates that at end of 1951 stocks of secondary material amounted to 154,082 tons. Mills are meeting increasing difficulty in disposing of secondary tin plate in this country and indicate before end of 1952 the production position may be such all NPA controls over the material can be removed.

NPA will appoint a task group to explore the recommendation. The committee was told an export program determination has been recommended which, if approved, would move about 75,000 net tons of secondary tin products and mill accumulation plate into export during first quarter 1952.

The committee also was informed a decision would be forthcoming quickly on the industry's request for a second quarter allotment of 7725 gross tons of pig tin.

Washington—Export quota of 120,000 short tons of specification production tin plate for food and petroleum packaging was established for second quarter by the Office of International Trade. Plate produced to definite order from a customer is covered. In addition, OIT shortly will announce export quotas for secondary tin plate.

The 120,000-ton quota includes 105,500 tons for food packing and 14,500 for petroleum packaging. In first quarter, 115,000 tons were licensed of which 99,000 were for food packing and 16,500 for petroleum. Quarterly average exports of tin plate in 1949 were 130,500 tons, and in 1950, they were 123,000 tons.

Cleveland—Tin plate producers are hoping their second quarter allotment of pig tin will enable them to maintain full plant operations. The industry has asked for 7725 gross tons for the period.

Rails, Cars . . .

Track Material Prices, Page 153

Birmingham—Bessemer plant of Pullman Standard Car Co. has booked an order for 125 seventy-ton covered hopper cars from the L. & N. railroad and an order for 25 from the Nashville, Chattanooga & St. Louis railway.

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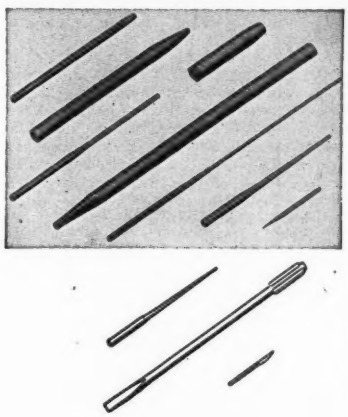

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Structural Shapes . . .

Structural Shape Prices, Page 151

New York—Most fabricators are unable to offer much tonnage for delivery under seven or eight months. They find it difficult to obtain shapes against new orders before third quarter, and, considering fabricating time in addition to extended mill deliveries, there is little they can promise before fall.

Some government work has been bid on by fabricators at prices under estimates of government engineers.

Philadelphia — Structural awards are spotty and fabricators are competing more sharply, especially on the higher-rated government and military projects. Shop backlogs are declining, as fabricators weed out, or at least place on the inactive list, various contracts which have fallen short of government approval.

Pittsburgh—Demand remains firm. Some easing was noted recently in smaller sizes but producers report these again are in firm demand. If the government keeps building programs at current levels mills see supply-demand balance achieved during third quarter.

Birmingham—There is no surplus of structural shapes as yet here and no indication of any in the near future.

Seattle—Fabricating plants have 3-month backlogs. New business for second and third quarters is being sought. Large shape tonnages are involved in a number of major defense projects to be placed in 60 days.

Pig Iron . . .

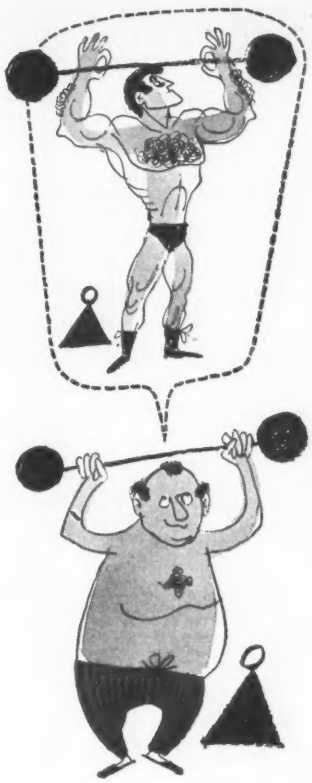
Pig Iron Prices, Page 150

Chicago — Despite below-capacity operations of many gray iron jobbing foundries all the pig iron available finds takers. Shops making machine tool castings are busy and farm implement foundries are increasing melts. U. S. Steel Co. restored the Gary No. 1 stack to the active list Jan. 29. This furnace went down for repairs Dec. 27.

New York—Most district foundries are pressing for pig iron, although not as hard as a few months ago because they are not operating as actively. Inventories are not as high as the government permits foundries to carry.

Buffalo—Additional reports of small job casting plants feeling the pinch of slackening in civilian goods production have failed to cause alarm among merchant pig iron sellers. Automotive castings interests are calling for less iron. However, large melters engaged in government work are expanding operations. More than 75 per cent of current district pig iron output is going to the steel furnaces.

Philadelphia—Pig iron continues in short supply. Despite the fact that many iron foundries are operating on a restricted basis, they are still pressing for pig iron to sweeten mixes. They are cutting down use of scrap. Nonintegrated steel mills are taking all the basic iron they can get. A blast furnace at Steelton is expected to be blown in around the middle of this month after having been down for several weeks for repairs. The



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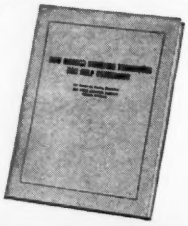
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Chester, Pa., furnace is back in operation after having been down for a few days due to an operating mishap.

Pittsburgh—Demand has fallen off here for merchant pig iron due to the cutbacks in consumer castings programs. Blast furnaces which had been down at U. S. Steel's Edgar Thomson Works and at Bethlehem's Johnstown, Pa. plant are now back in production. One furnace at U. S. Steel's Duquesne Works is currently down for repairs.

Cleveland—Smaller castings shops have been hit relatively hard by the cutbacks in civilian goods. However, they are continuing to take in pig iron though they are not pressing for tonnage as they were months ago. The heavy and medium foundries are stepping up operations on defense work and are taking up any slack in demand for iron that appears.

Birmingham—Merchant iron melters continue to take care of regional needs with the result most users are reasonably well supplied. But there is no iron for many outside the area who seek supplies from this district.

Scrap . . .

Scrap Prices, Page 158

Washington—Iron and steel scrap ceiling price regulation (CPR5) was modified by the Office of Price Stabilization by eliminating premium grade 30 hard steel cut 2 ft. and under from the regulation, and by easing the restrictions with respect to charging premiums established for grades 11 through 18, and for grades 20 and 21.

Under CPR5 as amended Oct. 22 last, grade 30 hard steel cut 2 ft. and under was established at a premium over the base grade price with an aim to aiding foundries in obtaining this material. Now, however, with foundry needs less pressing and continuance of the premium resulting in a dislocation in the movement of scrap, this provision in the regulation is removed.

As result of the further modification of the regulation, premiums established for grades 11 through 18 and grades 20 and 21 may be charged only when sold for use in electric furnaces, acid open-hearth furnaces or foundries. When sold for use in basic open hearth or blast furnaces, the ceiling price is that applicable for the corresponding basic open hearth or blast furnace grade except: Premiums for grades 20 and 21 may be charged when such material is sold for use in a basic open hearth or blast furnace in accordance with an allocation of the National Production Authority; premiums for grades 11 through 18 may be charged when the material is sold for use in a basic open hearth or blast furnace only if authorization is received from OPS.

Pittsburgh—The district's largest steelmaker has been able to return to production the remaining two of five open-hearth furnaces shut down last month due to critical scrap shortage. They currently have a four-day stock of scrap on hand in contrast to a 90-day supply generally held at this time of year. The situation continues bad and if inclement weather sets in for any length of time more furnace shutdowns in the district will be inevitable. Dealers report incoming collections are better than a month ago and only hope they can be sustained. There seems to be a plentiful supply of cast scrap here. Three old area bridges being dismantled have been earmarked for the district's furnaces along with iron and steel scrap from the old Mt. Oliver incline built 80 years ago.

New York—Brokers report continued active demand for open-hearth grades of scrap, with the tonnage flow accelerated by mild weather conditions. Cast grades are in relatively free supply, district foundry operations still lagging.

Philadelphia—While consumers of open-hearth scrap are still on a touch-and-go basis, none are having to curtail operations because of shortage of material. Practically all of this tonnage is under allocation and to date the system seems to be working out. Cast grades continue in easy supply. Pressure pipe foundries are taking in little tonnage and the soil pipemakers likewise. Electric furnace grades are under easing pressure.

Buffalo—An apparent shrinkage in scrap collections is attributed to the large volume of material bypassing dealers' yards on direct shipment to mill consumers. Dealers are still filling local allocation orders with only light movement of material out of the area. Cast scrap market fails to show improvement with prices soft but holding at ceiling levels.

Detroit—Steel mills here are becoming increasingly "fussy" over quality of scrap they accept. One mill, prevented from taking any scrap until its stocks come down to the common level prevailing in the industry, probably will be back in the market this month.

Cincinnati — District mills need scrap, but shipments are slightly improved, and closer attention is shown to specifications. Weakness in cast has weakened the undertone of the market. Dealers and brokers are again hunting outlets for cast, but cutting below price ceilings is nonexistent.

Chicago—U. S. Steel Co. last week restored to service the three Gary open hearths idled at start of the year for lack of scrap. Allocations are received at a rate sufficient to

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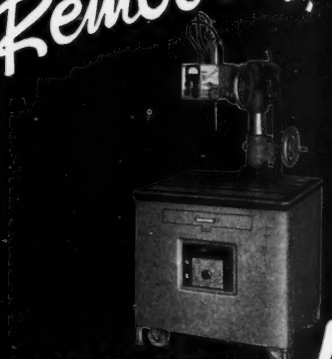

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There's a factory trained technical engineer in your area ready to give you a free demonstration in your own plant.

keep the furnaces operating but which permits no inventory building. Foundry grades of scrap and blast furnace material continue in good supply.

St. Louis—Steel scrap supplies took a moderate turn for the better last week as material unloaded by auto wreckers began hitting the market in volume. Outside shipments also improved somewhat. Mill stockpiles grew to probably 30 days compared to one to two weeks a month ago.

Birmingham—Pressure eases on the Birmingham scrap market. Moderate tonnage of free steel is reported and demand for most cast grades is considerably slower.

San Francisco — Korea battlefield scrap will be sent to this country, Robert Warner, Defense Production Administration salvage chief, said here.

Seattle—Scrap receipts about equal consumption. Buyers are extending their range of operations and competition between different areas is increasing. Seattle received three bids of $45 a ton for a small tonnage of cast iron scrap.

Warehouse . . .

Warehouse Prices, Page 157

Philadelphia—Distributors are making some progress in bringing inventories into better balance but they still have a way to go, especially in bars. They must offer substitute sizes, and so pressing is demand that these substitutions are accepted as a general thing. The distributors also are having difficulty building up stocks of plates and shapes.

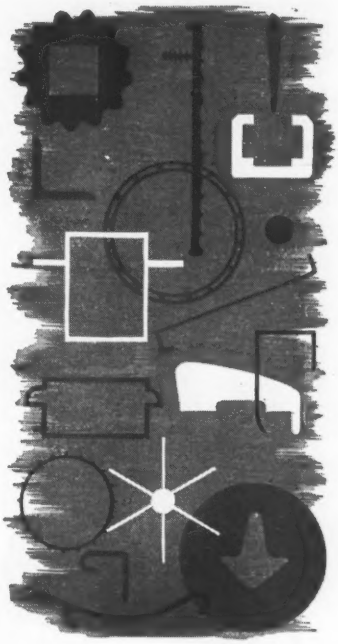
Pittsburgh — Warehouse receipts are just about holding their own in this area. No appreciable buildup is noted by most operators. Tightest items here are bars, plates and structural shapes. Cold-rolled is easier but galvanized and larger sizes of cold-finished rounds remain tight. Demand is holding firm.

Cleveland — Although the warehouses have been receiving somewhat larger tonnages from the mills, stocks continue unbalanced. Consumers must shop around for their needs in many instances. Demand continues strong though pressure for tonnage is not as intense as some time back, reflecting cutbacks in civilian goods manufacture, chiefly automotive.

Cincinnati—Clamor for warehouse steel has subsided. Inventory position is improved but large cold-finished rounds, structural shapes and some other items continue in tight supply.

Chicago—Consumers find it easier to obtain steel requirements from warehouses, though supply-demand balance is not yet attained. Stocks are unbalanced and lower than required for good service.

Seattle — Warehouses report no sign of a gray market in this area, recent federal regulations apparently having cleared up the situation. Foreign steel is available, from Japan and Europe, but prices are out of line. Warehouse stocks are badly broken and average only 30 to 50 per cent normal. Cold-rolled sheets, 18-gage and lighter, are easier but 16-gage and heavier are tight. Some specialty products are in improved supply. Bar supply is critical.



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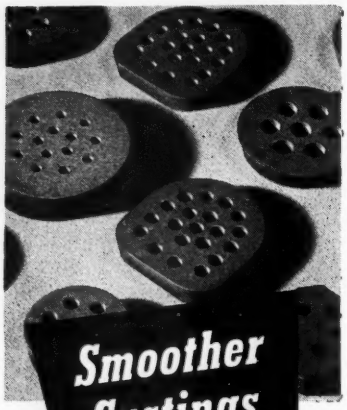

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Semifinished Steel . . .

Semifinished Prices, Page 151

Pittsburgh—District ingot rate increased two points to 101 per cent of capacity from last week's revised rate of 99 per cent. Forty workers of tugboat and coal hoist crews at U. S. Steel's Clairton, Pa. Works struck for about a 70-hour period which shut down the plant and caused loss of approximately 4000 tons of ingots by idling 11 open hearths. Pittsburgh Steel has three open hearths down for repairs. One open hearth at Allegheny Ludlum's Brackenridge, Pa. plant is also down for repair. The Wheeling rate is up 20 points to 100 per cent of capacity from last week's revised rate of 80 per cent caused by floods in the area.

Cleveland—The local works of Republic Steel Corp. produced more steel in January than in any previous month in its history. The plant's 15 open-hearth furnaces turned out 172,172 tons of ingots, 9000 tons more than in any previous month.

Youngstown — First four 250-ton open hearths at Youngstown Sheet & Tube Co.'s Indiana Harbor, Ind., plant will go into operation this spring. The second four 250-ton units will be started later in the year. The eight units will add over 1,200,000 tons to the company's open hearth ingot capacity in the Chicago district but plans are to dismantle the bessemer converter, so the net gain will be around 900,000 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1420 tons, section, Major Deegan expressway, Bronx, New York, to Harris Steel Co., that city.

1000 tons, Army warehouse, Mt. Ranier ordnance depot, Washington state, to Bethlehem Pacific Coast Steel Corp., Seattle; Zoss Construction Co., Portland, general contractor.

660 tons, building, International Latex Corp., Dover, Del., to Belmont Iron Works, Eddystone, Pa.

550 tons, Du Pont building No. 707, Gonzales, Fla., to Belmont Iron Works, Eddystone, Pa.

460 tons, auto maintenance shop Elmendorf air field, Alaska, to Pacific Car & Foundry Co., Seattle; Denali Construction Co., Anchorage, general contractor.

200 tons, alert hangar, municipal airport, Burlington, Vt., to Butler Mfg. Co., Kansas City, Mo.; St. Paul Construction Co., Boston, general contractor.

115 tons, miscellaneous construction, Fairless Works, United States Steel Co., Morrisville, Pa., to American Bridge Co., Pittsburgh.

STRUCTURAL STEEL PENDING

1172 tons proposed University of Washington men's dormitory, Seattle; 460 tons available in second quarter; plans in preparation.

1000 tons miscellaneous steel items, also 3214 pieces and 647 tower bodies; bids to Bonneville Power Administration, Portland, Oreg., Feb. 15.

1000 tons, Army warehouses, New Cumberland, Pa.; bids Mar. 5.

700 tons, Army transportation depot, Marietta, Pa.; bids Feb. 26.

700 tons, warehouse, General Electric Co., Philadelphia; bids closed.

600 tons, high school, Bucks county, Pennsylvania; bids closed.

600 tons, government warehouse, Ft. Meade, Md.; bids Feb. 19.

500 tons (estimated) tainter gates, hoists, etc., Big Cliff dam, Oregon; Gunderson Bros. Engineering Corp., Portland, Oreg., low to U. S. Engineer, Portland, $310,841.

240 tons, Washington state steel bridge, Cowlitz county; bids to Olympia Feb. 19.

200 tons, highway bridge, Cowhouse creek, Fort Hood, Tex.; bids Feb. 19, Corps of Engineers, Galveston, Tex.; also 50 tons reinforcing steel.

200 tons, alert hangar, Air Force base, Kansas City, Mo.; bids Feb. 14, Corps of Engineers, Kansas City.

110 tons, state bridge, New Castle, Del.; bids Feb. 20.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, warehouse and range testing facilities, Springfield armory, Springfield, Mass., to Concrete Steel Co., Boston; George H. Macomber Co., Boston, general contractor.

200 tons, hospital building, Air Force base, Limestone, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Consolidated Constructors Inc., Portland, general contractor; Lyons Iron Works, Manchester, N. H., structural steel.

100 tons, school structures, Bellingham and Burlington, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

300 tons, Washington state highway spans, Chelan, Cowlitz and Lewis counties; bids to Olympia, Feb. 19.

Unstated, two Oregon state viaducts, Douglas county; Tom Lillebo, Reedsport, Oreg., low, $90,565.

Unstated, three Oregon state by-pass structures, Marion county; Tom Lillebo, Reedsport, Oreg., low $102,942.

Unstated, three Oregon state Columbia highway spans; Parker-Johnson Co., Portland, Oreg., low $169,846.

Unstated, outside utilities, Elmendorf air field, Alaska; S. Birch & Sons, Seattle, and Lytle-Green, Alaska, joint low $582,158.

Unstated, School of Music building, University of Montana, Missoula; general contract to Pew Construction Co., Missoula.

PLATES . . .

PLATES PENDING

250 tons, one 250,000-gallon and one 200,000-gallon elevated steel water tanks, Air Force base, Larson, Wash.; bids Feb. 19, Corps of Engineers, Walla Walla, Wash.

100 tons or more, five steel cargo box barges, 110 x 26 x 7 ft. each; Corps of Engineers, Louisville, Ky., bids in.

Unstated, also shapes, 1200-ton Navy rocket launching ship; general contract to Puget Sound Bridge & Dredging Co., Seattle.

PIPE . . .

CAST IRON PIPE PLACED

250 tons, system expansion Rose City district, Portland, to Pacific States Cast Iron Pipe Co., Provo, Utah.

150 tons, system expansion, Vancouver, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Transportation Corps, 83 diesel-electric locomotives, to General Electric Co., Philadelphia, and 20 to Fairbanks, Morse & Co., Chicago.

RAILROAD CARS PLACED

New York, Chicago & St. Louis, 200 seventy-ton covered hopper cars, to Greenville Steel Car Co., Greenville, Pa., subsidiary of Pittsburgh Forgings Co., Coraopolis, Pa.

Steel Division, Ford Motor Co., Dearborn, Mich., 100 seventy-ton gondola cars, to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

Army Transportation Corps, Marietta, Pa., 1000 tank cars, 10,000 gallons each, eight wheel, welded, bids in.

Southern, 3500 cars, contemplated, with action contingent in a certain degree on an increase in freight rates; list comprises 1750 seventy-ton triple hopper cars, 1500 seventy-ton drop-end gondola cars and 250 ninety-five-ton ore cars.

RAILS PLACED

Central of New Jersey, 1465 tons to Bethlehem Steel Co.

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

GE Engineers Honored

Three engineers in General Electric Co.'s Transformer & Allied Products Division will be awarded the Mathewson gold medal for outstanding achievement in the field of metallurgy on Feb. 20. The award will be made by American Institute of Mining & Metallurgical Engineers to Cecil G. Dunn, Franklin W. Daniels, Michael J. Bolton and Fabian Lionetti. The medal is awarded for the paper or series of closely related papers with at least one common author, which represents the most notable contribution to metallurgical science in the three-year period preceding the award. The new recipients, upon examining the atomic structure of metals, discovered some of the factors controlling the growth of crystals in metals. Their studies were of practical value in relation to transformer manufacturing.

Campbell Buys Miller Steel

Miller Steel Co., Hillside, N. J., warehouse for steel and aluminum bars, tubes and sheets, was purchased by Robert Campbell, a vice president of the company. W. T. Miller will continue as president and L. A. Lindsley as treasurer.

Silicon Carbide Plant Moved

American Metallurgical Products Co. will move its manufacturing facilities from Hays, Pa., to Newcastle, Pa. The firm is rebuilding property formerly occupied by Consolidated Foundry Co. The new plant, which will have four times the operating capacity of the old one, will be used for the production of metallurgical silicon carbides, with adequate space for expansion to other operations. The company's general offices will remain at 3600 Forbes Ave., Pittsburgh.

Clendenin Expands Facilities

Clendenin Bros. Inc., Baltimore, manufacturer of copper, brass and aluminum nails, tacks, rivets, soldering coppers, etc., enlarged its soldering iron department through acquisition of equipment formerly operated by Revere Copper & Brass Inc.

Wallace Tube Gets Agency

Parker Appliance Co., Cleveland, appointed Wallace Tube Co., Milwaukee, as an authorized warehouse distributor for Parker tube fittings. This newly formed firm, under the direction of L. F. Mosenmayer, and associated with Wallace Tube Co., Chicago, also carries warehouse stocks of tubing in a variety of types and sizes.

Aluminum Fabricator Expands

Washington Aluminum Co. Inc., Arbutus, Md., aluminum fabricator, is erecting an addition containing about 6500 square feet and bringing its total floor area to approximately 32,000 square feet. Ernest C. Liskey Jr. is president.

Atlas Steels Triples Quarters

Atlas Steels Ltd. erected new offices and warehouse facilities in Vancouver, B. C., at a cost of more than $100,000. The new facilities triple the space provided in original quarters which were opened only two years ago.

Mallory Plans Expansion

P. R. Mallory & Co. Inc., Indianapolis, announced a $500,000 expansion program which will provide new facilities for the Capacitor and Metals & Ceramics divisions which will have, respectively, 35,000 and 27,000 square feet of additional manufacturing space.

Admiral Buys Plastics Firm

Admiral Corp., Chicago, purchased Molded Products Corp., that city, one of the largest custom molders of plastics in the country. Molded Products, to be operated as a subsidiary, has a plant at 4533 W. Harrison St. and produces about 150,000 television, radio-phonograph and record player cabinets a month.

Foundry Supply Firm Formed

Gordon Sondraker & Co., Maywood, Calif., was formed to provide foundry supplies and metal melting equipment for the foundry industry.

Morse Buys Hardware Line

Morse Mfg. Co. Inc., Syracuse, N. Y., purchased the hardware line of Catranis Inc., Syracuse, and will manufacture products of the latter concern at the expanded Morse plant.

Morris, Wheeler Diversifies

Morris, Wheeler & Co. Inc., Philadelphia, acquired Industrial Monorail & Conveyor Co., a division of W. H. Sink Iron Works, that city. The purchase was one of several moves contemplated by Morris, Wheeler & Co. to meet increased and more varied demands of industries in the district. The

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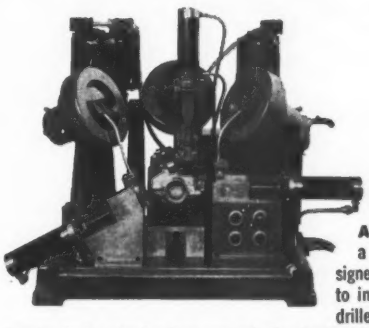
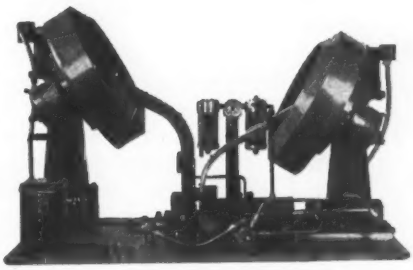
Modern production demands the speed and accuracy of this great aid to SELECTIVE FEEDING. It makes slow, manual methods obsolete and releases "frozen" manpower for more productive work. D.P.S. Motorized Hopper Units select, orient and feed production parts of a wide variety to a given position for primary and secondary operations. They are readily adaptable to all types of standard production equipment and special machines that would otherwise require constant attention by an operator.



At left is illustrated a special machine designed and built by D.P.S. to insert lead balls into drilled holes in a carburetor body, showing how our selective feeding device eliminates the slow, tedious hand insertion of the balls. The operator simply places the carburetor body in the fixture and presses a foot valve, three lead balls being simultaneously pressed into position—time saving, 66⅔%.



Above—The problem in this application was to insert a pal nut into a deep drawn stamping, which served as a base for a lamp finial. A double selecting problem existed, both in the selection of the pal nut and the stamping. The hand operation required that the operator pick up the stamping, insert the nut partially by hand, and finish the pressing operation by use of a small hand press. The Hopper Unit as a motorized selective feeding device entirely eliminated the manual element and made it possible to provide a completely automatic machine that more than doubled the total previous output of five operators.

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POUNDS OF STEEL PER PERSON

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Today we drive 40 million cars, listen to 90 million radios, keep food in 33 million refrigerators.

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How well does this competition of ours work in the steel business?

. . . The U.S.A. shows an 83.4% gain in steel output between 1939 and 1950. The rest of the world shows an 0.8% loss.

. . . In 1939, the U.S.A. under "competition" made ⅓ of all the world's steel. Today we produce half—all with only 6% of the people in the world.

. . . Steel workers under "competition" gained in jobs, too. There were 449 thousand jobs in 1939. Today—637 thousand.

The steel industry is just one example of how a free competitive system works. Ours is the security millions of people in the world dream of when they embrace such dead-ends as "planned economies".

Look around and see what happens when people hand their jobs and factories over to the government. Or have them taken by law. Or by force. Name it what you will—"communism", "nationalization", "socialism","regimentation"—it is a one-way street, and no turning back. By then people no longer own government. Government owns the people.

• • •

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

new facilities will be operated as part of its own Monorail & Crane Division. The monorail manufacturing area was more than doubled by extending operations conducted in a leased building to the purchasing company's warehouse at Fox street and Roberts avenue. R. T. Wiley is manager of Monorail & Crane Division. The company will celebrate its 125th anniversary next year.

Roberts & Mander Buy Firm

Price Fireplace Heater & Tank Corp., Buffalo, was acquired by Roberts & Mander Corp., Hatboro, Pa. Sale of Price Fireplace will not affect manufacturing operations of the firm in Buffalo. Roberts & Mander will make septic tanks and fuel oil tanks in Hatboro when manufacturing operations are resumed shortly. Price makes the same products in its Buffalo plant in addition to home fireplaces and outdoor grills.

Allis-Chalmers Builds Plant

A new Kansas City factory branch will be built in Independence, Mo., by Allis-Chalmers Mfg. Co., Milwaukee.

Snyder Represents Cummins

Raymond H. Snyder, former president and treasurer, Snyder Aircraft Division, Air Associates, Chicago, purchased certain assets of the Chicago operation of Cummins Diesel Sales Corp. He will operate the Chicago facilities as an independently owned Cummins dealership under the name of Cummins Illinois Engine Sales Inc. Headquarters are located at 1700 S. Indiana Ave., Chicago.

Exolon Expands Facilities

Exolon Co. is adding new production facilities at both its Tonawanda, N. Y. and Thorold, Ont., plants. New facilities at Tonawanda will permit a 15 per cent increase in output while at Thorold the output of fused aluminum oxide will be upped about 60 per cent. The project will cost about $662,000.

Electronics Division Formed

Titeflex Inc., Newark, N. J., manufacturer of flexible metal tubing and aircraft ignition harnesses, established an Electronics Division. Robert G. Brazenor will direct the division while William W. Buckley will assist as electronics sales supervisor.

Steel Co. of Canada Expands

A continuous slab heating furnace is being constructed by Rust Engineering Co. for Steel Co. of Canada Ltd., Hamilton, Ont. The furnace will increase capacity of rolled strip at the Hamilton Works by about 100 per cent and will have a rated capacity of 110 tons per hour. It will supplement the present two 60-ton per hour furnaces. Rust Engineering also has the contract to build a new 225-foot reinforced concrete chimney to serve the coke ovens. This is in addition to the 250-foot chimney recently completed.

SCRAPS DIE: Chrysler Corp. is scrapping this 15-ton body die as part of its intensive scrap metal campaign which has provided about 9.5 million pounds so far. The drive is in effect from dealers on up to assembly plants

Clarke Buys Machine Line

Porter-Cable Machine Co., Syracuse, N. Y., sold its floor sanding machine line to Clarke Sanding Machine Co., Muskegon, Mich. This transaction will enable Porter-Cable to devote more time to the engineering and distribution of portable electric tools.

Cleco Names Distributors

Cleco Division, Reed Roller Bit Co., Houston, appointed as distributors for its air tools and accessories in their areas: George W. Cassady Co., Williamsport, Pa.; Davenport Engineering Co., Davenport, Iowa; Monogram Air & Power Equipment Inc., New Haven, Conn.

Sylvania Buys Two Firms

Sylvania Electric Products Inc., New York, purchased the assets of A. W. Franklin Mfg. Corp. and Franklin Airloop Corp., Long Island City, N. Y. Franklin Mfg. produces all types of electrical sockets and many other components for the electronics industry while Franklin Airloop engages in die stamping of electrical circuits, air loops and other items. Unit out-

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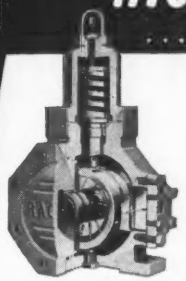

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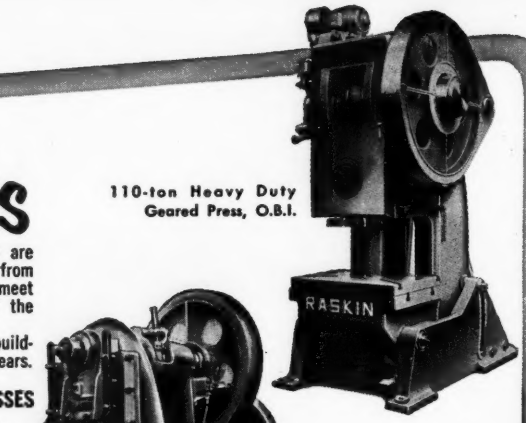

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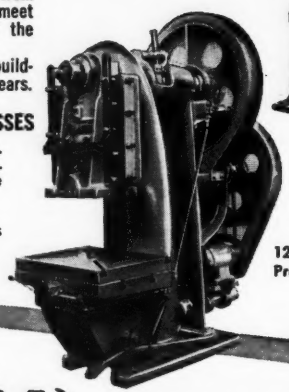

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De Laval Forms Subsidiary

De Laval Steam Turbine Co., Trenton, N. J., organized a subsidiary company, De Laval Turbine Pacific Co., with headquarters in the parent company's building at Main and Folsom streets, San Francisco. Officers of the new company are: G. W. Smith Jr., chairman; J. P. Stewart, president; C. F. Reeves, vice president and general manager.

Mower Output To Increase

Outboard Marine & Mfg. Co., Waukegan, Ill., purchased RPM Mfg. Co., Lamar, Mo., which makes power lawn mowers. Production of mowers, now at an annual rate of about 200,000, will be expanded.

Barrett Rebuilding Plant

Barrett Division, Allied Chemical & Dye Corp., New York, is starting a rebuilding program at its Youngstown plant. When completed production will be 10 times that at present. Project is estimated to cost between $1 million and $1.5 million. Roofing and road building materials are produced in the plant.

Steel Tubing Plant Enlarged

Avon Tube Division, Higbie Mfg. Co., Rochester, Mich., expanded its thinwall steel tubing facilities.

Continuous Metalcast Moves

Continuous Metalcast Co. Inc. moved its office to 44 Wall St., New York 5.

Koppers To Build Tar Plant

Koppers Co. Inc., Pittsburgh, purchased 26 acres at the Fontana mill of Kaiser Steel Corp. to be used for construction of an integrated tar processing plant. Kaiser Steel has agreed to sell to Koppers all tar produced in Kaiser Steel's chemical-recovery coke ovens until 1962.

Aeroquip Closes Agency

Aeroquip Corp. — flexible hose lines and self-sealing couplings—Jackson, Mich., terminated arrangements with its south-southwest United States distributor, Aeroquip Sales & Engineering Inc., Fort Worth, effective Jan. 31. Customers in that area now are being contacted directly by engineers operating directly from Aeroquip Corp. and its wholly-owned subsidiary, Aero-Coupling Corp., Burbank, Calif. Aeroquip personnel in the area includes: Edison D. Heins and James Tilford, Dallas and Houston; Jack Harlow, Birmingham; William Pickens, Wichita, Kans.; John McCarthy and Victor Emery, St. Louis and Kansas City, Mo.

Remington Rand To Expand

Remington Rand Inc., New York, plans to expand its Marietta, O., plant by about 100,000 square feet of additional floor space. This plant makes steel files, safe-cabinets and other insulated office equipment. The project will cost about $1.5 million.

Zurn Names Representative

Newton R. Crum, Long Beach, Calif., was named southern California sales representative for Zurn Western Service Inc., San Francisco, coupling manufacturer.

Curtiss May Buy Plant

Curtiss-Wright Corp., New York, is considering the locomotive shops of the Delaware, Lackawanna & Western Railroad in Scranton, Pa., as a possible production branch of its Aeronautical Division. If it takes over the property, the firm would produce a new type aircraft engine in Scranton.

Research Firm Changes Name

Physicists Research Co. changed its name to Micrometrical Mfg. Co. The company, located at 345 S. Main St., Ann Arbor, Mich., manufactures the profilometer and other shop instruments for surface measurement and control. The company's development operations were moved to 2821 S. State St., that city, and are operated as Micrometrical Development Corp. This corporation builds and sells only those instruments that are in process of development.

Delta-Star Plans Expansion

Delta-Star Electric Co. plans a $500,000 plant expansion program. This division of H. K. Porter Co. Inc., Chicago, will build extensions on both the north and south ends of the main factory, providing 30,000 square feet of additional assembly and machine shop space. The project will be completed by August, 1952.

Motor Firm Names Agents

Sterling Electric Motors Inc., Los Angeles, appointed as its distributors of power drives: Industrial Electrical Co., Modesto, Calif.; Butte Machinery Co., Butte, Mont.; Pomona Electrical Machinery Co., Pomona, Calif.; Industrial Motor Electric, Woodland, Calif.; Meyer Bros. Co., Phillipsburg, Pa.; Transmission Equipment Co., New York.

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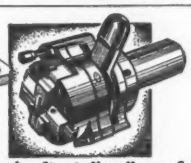

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